FACTORS AFFECTING DUAL CONTRACEPTION PREFERENCE AMONG SEROPOSITIVE WOMEN IN DISCORDANT RELATIONSHIPS IN NYATIKE SUB-COUNTY, KENYA

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DECLARATION

Declaration by candidate

This thesis is my original work and has not been presented for a degree in any other University. No part of this thesis may be reproduced without the prior written permission of the author and/or Rongo University.

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DEDICATION

This thesis is dedicated to my lovely wife Nancy Omenda who was my strongest ally, son Braxton, brother Willis, sister Sophy and may dear parents, Rojash and Elidah. Finally this thesis is dedicated to the entire Rongo University fraternity.

ABSTRACT

HIV-discordant couples are faced with dual problem of preventing unwanted pregnancy and HIV transmission to uninfected partner. Dual contraception involving consistent use of condoms to prevent STIs/HIV infection and another more effective modern contraceptive for pregnancy prevention has been recommended to offer dual protection for discordant couples. However a large proportion of new HIV infections and unwanted pregnancies in sub-Saharan Africa still occur in stable HIV-discordant partnerships. This is an indication that there is generally low dual contraception acceptance and use among discordant couples in sub-Saharan Africa and Nyatike Sub-county in Migori County, Kenya is no exception. Despite this, little is known about how demographic and socio-economic factors affect dual contraception preference among discordant couples. The objectives of this study were to find out the prevalence of dual contraception; determine the most common form of dual contraception used to offer dual protection; establish the association between demographic factors and dual contraception preference; and establish the association between socio-economic factors and dual contraception preference among seropositive women in discordant marital relationships in Nyatike sub-County in Migori County, Kenya. A cross-sectional survey design was employed. Fourteen health facilities were purposively sampled within Nyatike Sub-county. A total of 174 seropositive women in discordant marital relationships were randomly sampled from the fourteen health facilities and subjected to questionnaire interviews while another 28 took part in FGDs. Fourteen seronegative men were randomly sampled while fourteen healthcare providers (key informants) purposively sampled to take part in the study. Interviewer administered questionnaire was used to collect quantitative data while in-depth interviews and focused group discussions (FGDs) were used to collect qualitative data. Quantitative data was analyzed descriptively by way of frequencies and percentages. Cross-tabulation, Chi-square test and binary logistic regression modeling was also performed to test the relationship between independent and dependent variables. Thematic analysis was used to analyze qualitative data. Tables were used as techniques of presenting research results. The study revealed low dual contraception prevalence (29.3%) despite high level of dual contraception preference (63.2%) among the study participants. Condom plus injections was the most used form of dual contraception to offer dual protection at 24.1%, followed by condom plus implants at 19.1%. Parity (p=.001), level of education (p=.003) and monthly income (p=.026) were statistically significantly associated with dual contraception preference while age (p=.051) was not. Independent variables that significantly contributed to predicting dual contraception preference were age (p=.003), parity ($p < 0.05$) and level of education (p=.029). However level of monthly income (p=0.222) was not statistically significant in predicting dual contraception preference. The study recommends formulation of HIV integrated family planning programs that intensify efforts in improving knowledge of dual contraception use among seropositive women and its critical health benefits, coupled with encouraging constructive male partner communication and engagement in order to increase dual contraception uptake.

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LIST OF ACRONYMS AND ABREVIATIONS

ART	Antiretroviral Therapy
ARV	Antiretroviral
CPR	Contraceptive Prevalence Rate
FGDs	Focused Group Discussions
FHOK	Family Health Options Kenya
FP	Family Planning
FPAK	Family Planning Association of Kenya
HIV/AIDS	Human Immunovirus/Acquired Immunodeficiency Syndrome
IDI	In-depth Interviews
IUDs	Intrauterine Devices
KI	Key Informant
MoH	Ministry of Health
MTCT	Mother-to-Child Transmission
PMTCT	Prevention of Mother-to-Child Transmission
PrEP	Pre-Exposure Prophylaxis
QI	Questionnaire Interviews

STDs Sexually Transmitted Diseases

STIs Sexually Transmitted Infections

SSA Sub-saharan Africa

OPERATIONAL DEFINATION OF TERMS

Family Planning: A program to regulate the number and spacing of children in a family through the practice of contraception or other methods of birth control. (*Adapted from Essabella, 2012).*

Discordant Relationships: For the purpose of this study, it is a pair of long-term heterosexual relationships (marriage relations for at least 6 months prior to the study) in which one partner is infected with HIV and the other is not. *(Researcher, 2017).*

Seropositive women: HIV positive women.

Contraceptive Prevalence Rate: Is the proportion of women of reproductive age who are using (or whose partner is using) a contraceptive method at a given point in time. *(Adapted from Essabella, 2012).*

Dual Contraception Prevalence: Is the proportion of women of reproductive age who are using (or whose partner is using) dual contraception consistently at a given point in time. (*Researcher, 2017*).

Dual Contraception Preference: Refers to a greater liking to concurrently use condoms to prevent HIV/STIs infection and a highly effective modern contraceptive for pregnancy prevention to offer dual protection. *(Researcher, 2017).*

Dual Contraception Use: Consistent condom use to prevent HIV/STIs infection together with a more effective modern contraceptive method (hormonal, intrauterine devices, permanent) for pregnancy prevention. (*Adapted from Antelman et al., 2015).*

Dual Protection: Concurrent prevention of unwanted pregnancy and sexually transmitted infections. *(Adapted from Haddock et al., 2008 page.18).*

Discordant Couples: Is a pair of long-term sexual partners in which one is infected with HIV and the other is not. (*Adapted from Haddock et al., 2008).*

Form of Dual Contraception: Refers to the type of dual method combination *(Researcher, 2017).*

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter presents the background of the study, problem statement, study objectives, research questions, scope and limitations of the study. In addition, the chapter contains justification and assumptions of the study.

1.2 Background of the Study

Globally, an estimated 36.7 million people were living with HIV at the end of 2015, with nearly 70% of them residing in Sub-saharan Africa (SSA) (WHO, 2016). Further, 50% of PLHIV globally are women (Bongomin *et al.,* 2018), an indication that women are more vulnerable to HIV infection. Hit hard with High HIV prevalence, SSA also experiences low modern CPR (23.9%), which has caused the region to have the highest population growth rate globally (Izugbara, 2018). These countries have therefore embarked on the provision of modern contraceptives and sensitization on family planning (Mulongo *et al.,* 2017) to reduce new HIV infections (Paul *et al*., 2014; Okigbo *et al*., 2015) and unintended pregnancies (Haddock *et al*., 2008; Haddad *et al*., 2015).

However, despite increased contraceptive awareness in SSA, (Grabbe *et al*., 2008; Okigbo *et al*., 2015), unmet need for modern contraception is still high (23.6%) among women of reproductive age (Izugbara *et al.,* 2018). In Kenya, the government initiated FP programs in

1957 with the Family Planning Association of Kenya (FPAK now Family Health Options Kenya (FHOK)) mandated to operate FP clinics within Ministry of Health facilities (Okech *et al*., 2011). However, more than six decades later, only 53.2% of women in union (married or cohabiting with a male partner) use modern contraceptives (KNBS and ICF macro, 2015), with Migori County modern CPR being only 44%. This is despite being the fourth ranked county with the highest HIV prevalence (14.3%) which is more than double 5.9% national prevalence (KNBS and ICF macro, 2015).

The contraceptive use is however complex among discordant couples who are concerned with prevention of unintended pregnancy and HIV transmission to uninfected partner. Initially, discordant couples were in the past advised not to have children (Mathews, *et al*., 2011). However, with international reproductive guidelines shifting from avoidance of pregnancy to recommending conception and parenting among discordant couples (Izugbara *et al.,* 2018) coupled with both socio-cultural pressure and the use of ART (Chakrapani *et al.,* 2011), discordant couples are motivated to have children in an environment with limited integration of FP and HIV services which results in new HIV infections (Gebrehiwot *et al.,* 2017).

Studies have therefore recommended dual contraception use for dual protection among discordant couples (Haddock *et al*., 2008; Chakrapani *et al.,* 2011). However, its use is relatively low globally with a rate ranging from 7% to 23% among women of reproductive age (19% for married women) in USA (Brown, *et al.,* 2011 and Eisenberg, *et al.,* 2012), 15% to 30% in Europe (Higgins and Cooper, 2012), 27% in Canada (Patterson *et al*., 2014) and 29.6% in Thailand (Munsakul *et al.,* 2016). In sub-Saharan Africa, low dual contraception prevalence of 27.2% in Nigeria (Lewani *et al.,* 2014), 34% in Namibia (Antelman *et al.,*

2015) and 15.7% in Ethiopia (Gebrehiwot *et al.,* 2017) has also been noted among seropositive women. Researchers have similarly shown low dual contraception prevalence of 28% (Antelman *et al.,* 2015) and 38.5% (Mulongo *et al.,* 2017) among seropositive women in Kenya. Surprisingly, no research on dual contraception use and preference exist in Nyatike Sub-county of Migori County.

Despite demographic and socio-economic factors playing a key role in determining dual contraception use (Munsakul *et al.,* 2016; Mulongo *et al.,* 2017), their effect on dual contraception preference among seropositive women in discordant relationships was largely missing in the literature. This necessitated the current study to investigate the correlation between these variables so as to enhance development of HIV integrated FP policies that encompasses diverse contraceptive preference among discordant couples in order to promote the use of dual contraception.

1.3 Statement of the Problem

Studies have shown high unintended pregnancy among HIV positive women as compared to HIV negative women (Gebrehiwot *et al.,* 2017), which necessitates special attention in reproductive health concerns of HIV positive women in order to maintain healthy generation in future. This will significantly eliminate mother-to-child-transmission (MTCT) of HIV and maternal mortality related to unintended pregnancies which are major public health problems particularly in sub-Saharan Africa (WHO, 2016).

More importantly, the reproductive health services among seropositive women in discordant relationships who are faced with dual problem of preventing unintended pregnancy and HIV transmission to uninfected male partner needs to emphasize on dual contraception use as recommended by WHO (Munsakul *et al.,* 2016). This is because its utilization still remains a great challenge among this population due to the fact that contraceptives effective in preventing pregnancy are female-controlled while those effective in preventing HIV/STIs transmission are male controlled (Jain, 2012) hence requires partner communication and cooperation. Even though discussion on dual contraception by discordant couples enhances its use (Gebrehiwot *et al.,* 2017), such discussions are limited due to partner disapproval (Mulongo *et al.,* 2017).

Secondly, encouraging condom use for dual protection among discordant couples by HIV care providers with limited deliberations on the benefits of additional contraceptive methods further aggravate this problem (Antelman *et al*., 2015). Studies have shown that using male condoms alone for dual protection is not effective as dual contraception use because it results in approximately 15-18% unintended pregnancies yearly for typical users (Antelman *et al.,* 2015; Munsakul *et al.,* 2016; Mulongo *et al.,* 2017). Also, effective methods for pregnancy prevention such as female sterilization, vasectomy, intrauterine devices (IUDs) and hormonal contraceptives (pills, injections and implants) do not protect against HIV/ STIs transmission (Hatcher *et al.,* 2011).

Besides contraceptive method and health care provider related factors, the low dual contraception prevalence among seropositive women of reproductive age is a product of interplay of their socio-economic and demographic characteristics (Munsakul *et al.,* 2016; Mulongo *et al.,* 2017). Both demographic and socio-economic factors, though very important determinants of dual contraception use, have attracted little attention from scientific researches (Stephenson *et al*., 2011) particularly with regard to their effect on dual contraception preference among discordant couples.

To enhance adoption of dual contraception as an effective approach to achieve zero HIV transmission and unwanted pregnancy among discordant couples (Mulongo *et al.,* 2017), a focus on how their demographic and socio-economic characteristics affects their preference for dual contraception was thus necessary. This was so particularly in Nyatike Sub-county where no previous research on dual contraception preference and associated factors existed. This was to enhance development of efficient and effective counseling interventions to promote dual contraception use among discordant couples.

1.4 Objectives of the Study

1.4.1 General Objective

To determine factors affecting dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub-county in Kenya.

1.4.2 Specific Objectives

i. To find out dual contraception prevalence among seropositive women in discordant marital relationships in Nyatike Sub-county.

ii. To determine the most common form of dual contraception used to offer dual protection among seropositive women in discordant marital relationships in Nyatike Sub-county.

iii. To establish the association between demographic factors and dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub-county.

iv. To establish the association between socio-economic factors and dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub-county.

1.5 Research Questions

i. What is the prevalence level of dual contraception use among seropositive women in discordant marital relationships?

ii. What is the most common form of dual contraception used to offer dual protection among seropositive women in discordant marital relationships?

iii. Is there any association between demographic factors and dual contraception preference among seropositive women in discordant marital relationships?

iv. Is there any association between socio-economic factors and dual contraception preference among seropositive women in discordant marital relationships?

1.6 Justification of the Study

Despite dual contraception being an effective strategy for reducing new HIV infections and unwanted pregnancy among discordant couples, previous studies have focused on its use and associated factors among the general population of seropositive women. A focus on seropositive women in discordant relationships was thus missing, particularly with regard to how their demographic and socio-economic characteristics influence their preference for dual contraception, hence justifies the current study.

1.7 Significance of the Study

This study helped unravel the level of dual contraception use and the nature of relationship between demographic and socio-economic variables and dual contraception preference among seropositive women in discordant relationships in Nyatike Sub-county. This will help the National government through the Ministry of health in collaboration with Migori County

Ministry of health and Non-governmental organizations (NGOs) to formulate and implement HIV integrated FP programs, including designing efficient and effective counseling interventions to promote the use of dual contraception among the target group.

1.8 Scope and Limitations of the Study

The study was limited to fourteen health facilities in Nyatike Sub-county in Migori County, Kenya. It mainly focused on the association between demographic and socio-economic factors and dual contraception preference. The target population was seropositive women in discordant marital relationships, aged between 18-49 years (182 survey respondents and 28 FGDs participants). The age bracket was appropriate because these women were within the conventional reproductive period for women. Fourteen seronegative men in discordant marital relationships (aged between 18-59 years) and fourteen health providers were included for in-depth interviews. The inclusion of men was necessary because women live in a context where they do not make unilateral decisions about their reproductive health. Failure to include seronegative women in discordant relationships and 4.4% of sampled survey respondents later refusing to participate were the limitations of this study.

1.9 Assumptions of the Study

This study was based on the following assumptions:

1. Discordant couples have varied preferences for dual contraception.
2. Discordant couples are concerned with prevention of unwanted pregnancy and HIV/STIs transmission to uninfected partner.
3. The respondents shall provide accurate and honest responses to study questions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of previous studies on dual contraception prevalence and preference among seropositive women in discordant relationships under the following sub-headings: dual contraception prevalence, most common form of dual contraception, demographic factors and dual contraception preference and socio-economic factors and dual contraception preference. The chapter also presents the knowledge gaps which this study intended to fill, theoretical framework and finally conceptual framework.

2.2 Dual Contraception Prevalence among Seropositive Women

The prevalence of HIV discordance is high among heterosexual couples in Africa (Lurie *et al*., 2003; Sagay *et al*., 2006), particularly in sub-Saharan Africa where half of PLHIV in stable relationships are discordant (Makwe and Giwa-Osagie, 2013). Further, SSA also witnesses a large proportion of new HIV infections among these discordant couples (Brubaker *et al.*, 2010), which is an indication that they engage in unprotected sexual intercourse.

Medical strategies available for reducing the high rate of HIV transmission among discordant couples include couple based HIV testing and counseling to disclose partner HIV status, administering ART to infected partner to suppress viral load (Chadwick *et al*., 2011; Tsuyuki *et al*., 2013), administering PrEp to uninfected partner before sexual intercourse or post exposure prophylaxis after unprotected sex (Mathews *et al*., 2011; Mmeje *et al*., 2012),

treatment of STIs and circumcision of uninfected male partner (Curran *et al*.,2012). In addition, discordant couples who desire to have children should carry out home manual insemination or timed unprotected sex during woman's peak fertility period (Mathews *et al*., 2011) to limit chances of HIV infection. Despite these strategies, discordant couples still engage in unprotected sexual intercourse (Chadwick *et al*., 2011), a cause for high pregnancy and HIV transmission rates witnessed among them.

Faced with dual problem of preventing unintended pregnancy and HIV transmission to uninfected partner, contraceptive method providing dual protection is the best option for discordant couples. This can be achieved by correctly and consistently using either male or female condoms singly. However, women being unable to discuss safe sex because they are culturally weak (Haddock *et al*., 2008), partner desire for sensation (Imbuki *et al*., 2010; Tsuyuki *et al*., 2013) and linking condom use with infidelity (Teklu and Davey, 2008) interferes with long-term use of condoms in stable relationships. Further, contraceptive methods such as vasectomy, female sterilization, intrauterine devices (IUDs) and hormonal contraceptives effectively prevent pregnancy but do not protect against HIV/STIs.

Thus, the most prudent approach to dual protection is dual contraception which involves consistent condom use to prevent HIV/STIs infection together with effective modern contraceptive for pregnancy prevention (Oni *et al*., 2003; Haddock *et al*., 2008; Haddad *et al*., 2015). However, this being a complex strategy to dual protection, its use has been relatively low with a rate ranging from 7% to 23% among women of reproductive age in USA (Brown, *et al*., 2011 and Eisenberg, *et al*., 2012), 15% to 30% in Europe (Higgins and Cooper, 2012),

25% among married women living with HIV in India (Chakrapani *et al.,* 2011) and 34.2% among HIV positive women in Thailand (Munsakul *et al.,* 2016). African studies have similarly shown low dual contraception prevalence of 38% in Zimbabwe (Magwali *et al.,* 2005), 27.2% in Nigeria (Lewani *et al.,* 2014), 34% in Namibia (Antelman *et al.,* 2015), 19.7% in Ethiopia (Teklu and Davey, 2008) and 15.7% again in Ethiopia (Gebrehiwot *et al.,* 2017). In Kenya, a low dual contraception prevalence of 28% (Antelman *et al.,* 2015) and 38.5% in Bungoma County (Mulongo *et al.,* 2017) has also been reported.

These previous studies focused only on the entire PLHIV and women living with HIV but failed to establish specific dual contraception prevalence among discordant couples, the knowledge gap which this study intended to fill, particularly in Nyatike Sub-county where such information was non-existent.

2.3 Most Common Form of Dual Contraception among Seropositive Women

The reproduction technologies that have been developed to prevent HIV transmission while allowing for safe conception among discordant couples such as Insemination with partner's semen and sperm washing of seropositive male partner coupled with intrauterine insemination (Delvaux and Nostlinger, 2007; Brubaker *et al*., 2010) are beyond the reach of the poor population because of their high cost.

The low cost modern contraceptives available for use by discordant couples to avoid unintended pregnancy includes hormonal contraceptives (pills, injections, implants and vaginal rings); permanent contraceptive methods (female sterilization/tubal ligation and vasectomy); intrauterine devices (IUDs) and barrier contraceptives (male and female

condoms). Traditionally, discordant couples should embrace withdrawal, abstinence and rhythm method as a safe measure for birth control (Haddad *et al*., 2015). These contraceptives except condoms (modern) and abstinence (traditional) only prevent pregnancy but do not prevent HIV transmission. Based on this, discordant couples are supposed to use dual contraception involving consistent condom use for preventing HIV transmission in conjunction with non-barrier contraceptive for pregnancy prevention. The type of non-barrier contraceptive used in combination with condoms however varies across this population.

Whereas a study in Thailand has shown condom plus sterilization as the most common form of dual contraception used among PLHIV at 69.8% (Munsakul *et al.,* 2016), African studies have shown condom plus injectables as the most common form of dual contraception used among women living with HIV at 78.9%, in Nigeria (Lewani *et al.,* 2014), 68.6% in Ethiopia (Gebrehiwot *et al.,* 2017) and 51.4% in Kenya (Mulongo *et al.,* 2017). Similarly, 56% of study participants in Namibia, Kenya and Tanzania reported using condom plus injectables whereas only 20% and 17% used female sterilization and oral pills with condoms respectively (Antelman *et al.,* 2015). Even though injection is highly used among participants reporting dual contraception use, its proportion of use varies regionally. This is evident in the findings of Okigbo *et al.* (2015) where the proportion of women reporting use of injectables plus condoms in Kenya, Nigeria and Senegal were 24%, 25% and 13% respectively.

Based on these observed regional variation among study participants in different study settings coupled with previous studies focusing their investigation on entire population of women living with HIV with no distinction of those in discordant relationships, there is need

to investigate the most common form of dual contraception for dual protection among seropositive women in discordant relationships in Nyatike Sub-county because it is non-existent.

2.4 Demographic Factors and Dual Contraception Preference

The reviewed studies on dual contraception use among discordant couples focused on knowledge, use and concerns about contraceptive methods, (Grabbe *et al*., 2008; Munsakul *et al.,* 2016), consistency of condom use (Tsuyuki *et al*., 2013), effect of non-barrier contraceptives on consistent condom use and behavioral interventions to boost dual contraception use (Lopez *et al*., 2014), effect of consistent condom use on use of non-barrier contraceptives and dual method (Ngure, *et al*., 2013; Tsuyuki *et al*., 2013), prevalence of dual contraception (Chakrapani *et al*., 2011; Lewani *et al*., 2014) and factors associated with dual contraception uptake (Gebrehiwot *et al.,* 2017; Mulongo *et al.,* 2017).

Among the factors noted to increase the odds of using dual contraception included fear of transmitting HIV to uninfected partner and HIV diagnosis coupled with post test HIV counseling (Chakrapani *et al.,* 2011; Mulongo *et al.,* 2017), having HIV negative partner (Gebrehiwot *et al.,* 2017), and being female (Munsakul *et al.,* 2016). On the other hand, fear of side effects of non-condom contraceptives, higher CD4 count (due to use of ART), lack of involvement of men in FP programs and failure by healthcare providers to enlighten patients on the benefits of other contraceptives other than condoms were associated with less use of dual contraception (Chakrapani *et al.,* 2011).

Even though few studies have focused on dual contraception use among HIV positive men and women in sub-Saharan Africa (Antelman *et al.*, 2015), none has explored how age and parity affects dual contraception preference among seropositive women in discordant relationships as discussed henceforth.

2.4.1 Age

Generally, woman's age has been noted to influence contraceptive use. A study in Uganda shows that younger age increases odds of contraceptive utilization (Bongomin *et al.,* 2018). However, younger married seropositive women who have fewer children tend not to use contraceptives in order to have children (Antelman *et al.,* 2015). On the contrary, women of advanced age who have completed their desired family sizes report higher use of contraceptives, indicating probable influence of a woman's age on her preference to or not to use contraceptives.

With regard to dual contraception among seropositive women, researchers have shown that dual contraception prevalence is highest among those aged 18-24 years in Australia (Parr and Siedlecky, 2007) and 15-24 years in USA (Eisenberg, 2012; Higgins and Cooper, 2012). The high prevalence of dual contraception use observed among young women may logically reflect their greater effort to reduce their vulnerability to both unintended pregnancy and HIV/STI transmission, a similar problem facing discordant couples. However, contrary to this observed trend, a study in Canada (Patterson *et al*., 2014) and Thailand (Munsakul *et al.,* 2016) found that seropositive women reporting high use of dual contraception were older with higher parity.

Corroborating findings from other studies, sub-Saharan Africa studies have shown that older age is associated with decreased odds of using dual contraception among people living with HIV and that individuals reporting dual contraception use tend to be younger (Moroni *et al.,* 2007; Antelman *et al.,* 2015; Gebrehiwot *et al.,* 2017). The findings of these studies however focused on use but not preference for dual contraception and were based on seropositive women without a clear distinction of those in discordant relationships. Thus an investigation into how age of seropositive women in marital discordant relationships correlates with their preference for dual contraception was fundamental particularly in Nyatike Sub-county where such vital information was non-existent.

2.4.2 Parity

Women with low parity (few numbers of living children) have low contraceptive prevalence because they intend to have more children as opposed to those with higher parity who tend to use contraceptives to stop births (Oni *et al*., 2003; Haddad *et al.,* 2015; Bongomin *et al.,* 2018)**.** This relationship has also been observed with dual contraception use among some population. Patterson *et al.* (2014) noted high use of dual contraception among seropositive women reporting high parity. In a study on pregnancy desire and dual contraception use among people living with HIV attending clinical care in Kenya, Namibia and Tanzania, it was noted that having fewer living children was associated with decreased odds of using dual contraception (Antelman *et al.* (2015). On the contrary, a study in Ethiopia noted that higher parity decreased the odds of dual contraception use among women on antiretroviral therapy (Gebrehiwot *et al.,* 2017). These recent studies focused on dual contraception use among seropositive women and do not have specific analysis of how parity correlates with dual

contraception preference among seropositive women in discordant marital relationships. Therefore, it is on this basis that this study was pegged.

2.5 Socio-economic Factors and Dual Contraception Preference

2.5.1 Level of Education

Generally studies have shown significant positive association between level of education and contraceptive use (Nwosu *et al*., 2011; Esabella, 2012). A study in Tanzania (Damian *et al.*, 2018) and Uganda (Bongomin *et al.*, 2018) indicates that higher levels of education increase the odds of contraceptive utilization. Further, a greater proportion of women using contraceptives in Kenya had secondary education (49%), 15 percent had primary education while six percent had no formal education (Okech *et al.,* 2011). This is because educated women make informed choices and less likely adhere to cultural and religious beliefs that prohibit contraceptive use (Nwosu *et al*., 2011). They too (educated women) adhere to counseling delivered to them by health care providers with respect to contraceptive use for pregnancy prevention.

With regard to dual contraception use, a review has shown contradicting results. A study in Thailand (Munsakul *et al.,* 2016) and South Africa (Moroni *et al*., 2007) found no relationship between education and dual contraception use among seropositive women. Similarly, no correlation was noted between level of education and dual contraception use among PLHIV in Namibia, Tanzania and Kenya (Antelman *et al.* (2015). However in Ethiopian study, literate respondents were more likely to use dual contraception than illiterate respondents (Teklu and

Davey, 2008). Further, high levels of education have been noted to increase odds of dual contraception use among seropositive women in Ethiopia (Gebrehiwot *et al.,* 2017) and Kenya (Mulongo *et al.,* 2017). These results were based on the general population of seropositive women and did not distinguish those in discordant relationships. Secondly, they focused on dual contraception use but not preference. This study therefore intended to establish the correlation between level of education and dual contraception preference among this population because such information was non-existent particularly in the study area.

2.5.2 Monthly Income Levels

Low cost and proximity of services motivates women to use modern contraceptives (Kayongo, 2013), an indication that cost is a significant determinant of contraceptive use. Many people lack resources to access family planning services especially the transport cost when the health facility is far away (Karra and Lee, 2012). Additionally, opportunity cost of time spent away from income generating activities make contraceptives seem like a luxury thus impedes uptake of contraceptives (Kayongo, 2013).

Further, parallel disparities exist between developing and developed countries with regard to contraceptive access and use. It is estimated that only 45.7% of women of reproductive age in less developed countries use modern contraceptives compared to 68% in Europe (Gikaduo and Vyena, 2015). Contrary to the findings that low household income hinders use of modern contraceptives provided by private sector in Pakistan (Agha, 2000), severe decline in household income resulted in a small increase in proportion of couples using contraceptives in Indonesia (Karra and Lee, 2012), perhaps reflecting couple's increased need to postpone

pregnancy due to increasing costs of raising children. In East Africa, studies in Tanzania (Damian *et al.,* 2018) and Uganda; (Bongomin *et al.,* 2018) have found positive correlation between daily income and monthly income with contraceptive use respectively among seropositive women.

More developed countries have been shown to have high dual contraception prevalence (Higgins and Cooper, 2012; Munsakul *et al.,* 2016) than less developed countries (Lewani *et al.,* 2014; Gebrehiwot *et al.,* 2017) perhaps due to high monthly income levels that enhance access to a wider variety of contraceptive options. Studies that have associated contraceptive use with income levels have focused mainly on single methods (Agha, 2000; Gikaduo and Vyena 2015; Dias and Oliveira 2015; Damian *et al.,* 2018; Bongomin *et al.,* 2018). A focus on the correlation of monthly income levels and dual contraception preference among discordant seropositive women is thus missing in the current literature and this study therefore intended to establish this correlation.

2.6 Summary of Literature Review and Gap in Knowledge

Literature reviewed in this study revealed low dual contraception prevalence among PLHIV despite its health benefits among this population. However, dual contraception prevalence among seropositive women in discordant marital relationships was lacking in the literature reviewed and particularly in Nyatike Sub-county. The review also revealed regional variation in the most common form of dual contraception used to offer dual protection, necessitating a research on the same as it was non-existent in the intended study setting. The literature revealed some correlation between dual contraception use and demographic factors of PLHIV

but no study specifically determined this correlation among seropositive women in discordant relationships. More surprisingly the literature failed to explore the association between demographic (age, parity) and socio-economic factors (level of education, monthly income levels) and preference for dual contraception among seropositive women in marital discordant relationships.

2.7 Theoretical Framework

This study was based on the *Theory of Planned Behavior* developed by Icek Ajzen in 1985 to predict individual's intention to perform a behavior (Ajzen, 1991). The proponent of the theory argues that a person's behavior is determined by his/her intention to perform the behavior. This intention is determined by three things: their personal attitude toward the specific behavior, that is, a person's opinion about whether behavior is positive or negative; their subjective norms (social pressure), that is, the individual's impression of the way their society perceives the same behavior; and their perceived behavioral control, that is, their perceptions of their ability to perform the behavior. When personal attitude and the subjective norm are more favorable coupled with greater perceived control, the stronger the person's intention to perform the behavior in question.

In the context of this study, dual contraception preference is a behavior. The decision by seropositive women to prefer or not to prefer dual contraception is based on their perceived outcomes i.e. its health benefits versus the associated side effects, social pressure from their society (partners, family members and friends) and their ability to prefer and subsequently use dual contraception. This theory is best applicable in studies involving disease prevention and

birth control behaviors (Sparks, 1994), thus it was fit for this study because both disease prevention (prevention of HIV to uninfected partner) and birth control are the main concerns of discordant couples.

2.8 Conceptual Framework

Use of dual contraception among seropositive women in discordant marital relationships may be influenced by a number of factors which include but not limited to demographic variables such as age and parity and socio-economic factors such as level of education and income level. Age can be associated with preference for dual contraception because different age groups have different contraception knowledge and needs. Parity is likely to influence dual contraception preference because seropositive women have different preferences for their family sizes. In addition, women with higher education level, are better informed than women with lower education and therefore likely to use contraceptive methods. Women in low income households are less likely than women in high income households to use high cost specialized contraceptives like tubal ligation.

Related to the above are knowledge about dual contraception, attitude, availability and costs associated with use of dual contraception. These are important mediating factors facilitating the above-described linkages between independent and dependent variables. Inadequate knowledge about contraception brings fear and rumors about FP methods and can prevent seropositive women from seeking dual contraception. A person's attitude towards use of dual contraception, based on his/her opinion on the expected positive or negative outcome, greatly influences dual contraception use. The transport cost to distant health facilities coupled with opportunity cost of time spent away from economic activities greatly impede uptake of both

free and low-cost contraceptives. Also, availability of a wide range of contraceptive methods can help clients find those that match their health circumstances, lifestyle and preferences.

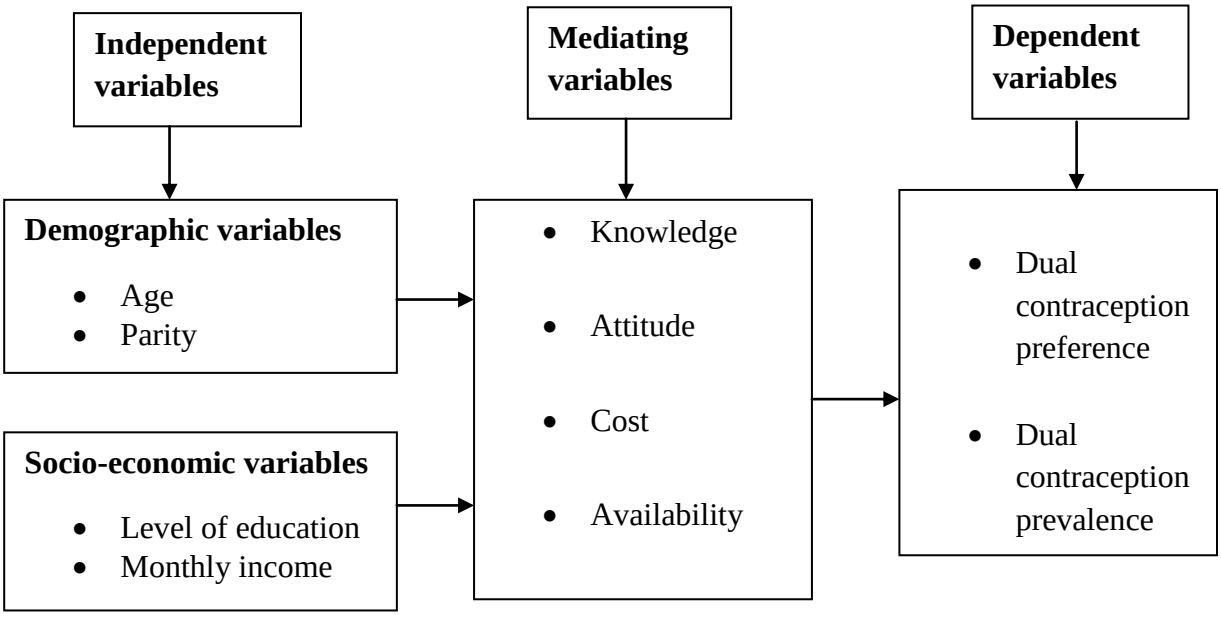

Figure 2.1: Conceptual Framework

Source: Adapted from Essabella, 2012

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter gives description on the process of data collection, analysis and presentation. It focuses on the study area, study design, study population, sample selection and size, variables, data collection instruments, data collection procedures, data analysis, data presentation, ethical considerations and finally methodology matrix.

3.2 The Study Area

The study was conducted in Nyatike Sub-county, Migori County, Kenya. Nyatike Sub-county is located between longitude 33^0 57'E and 34^0 19'E and between latitude 0^0 45'S and 1^0 08'S. Administratively, the sub-county is divided into seven County Assembly Wards. It has a population size of 144,625 and an area of approximately 677.510km^2 (KNBS and ICF macro, 2015). The main economic activity for people in Nyatike sub-county is gold mining, fishing, trade and agriculture (both crop and cattle rearing). The Sub-county has a total of 42 functional health facilities which includes two sub-county hospitals, two health centers, five medical clinics and 33 dispensaries with a total of 344 seropositive women in discordant marital relationships (MoH, 2017). The study area was chosen because there was surprisingly no research that had attempted to show how demographic and socio-economic variables of seropositive women in discordant marital relationship affected their preference for dual contraception.

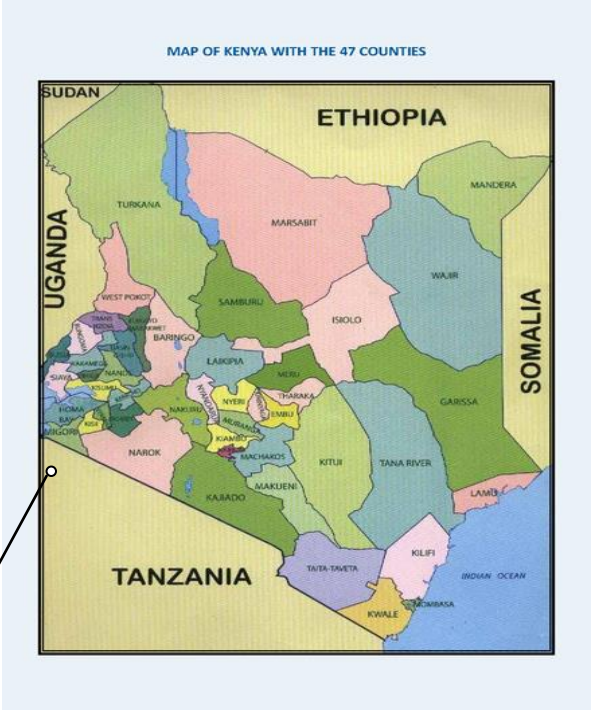

Figure 3.1: Map of Kenya showing Study Area

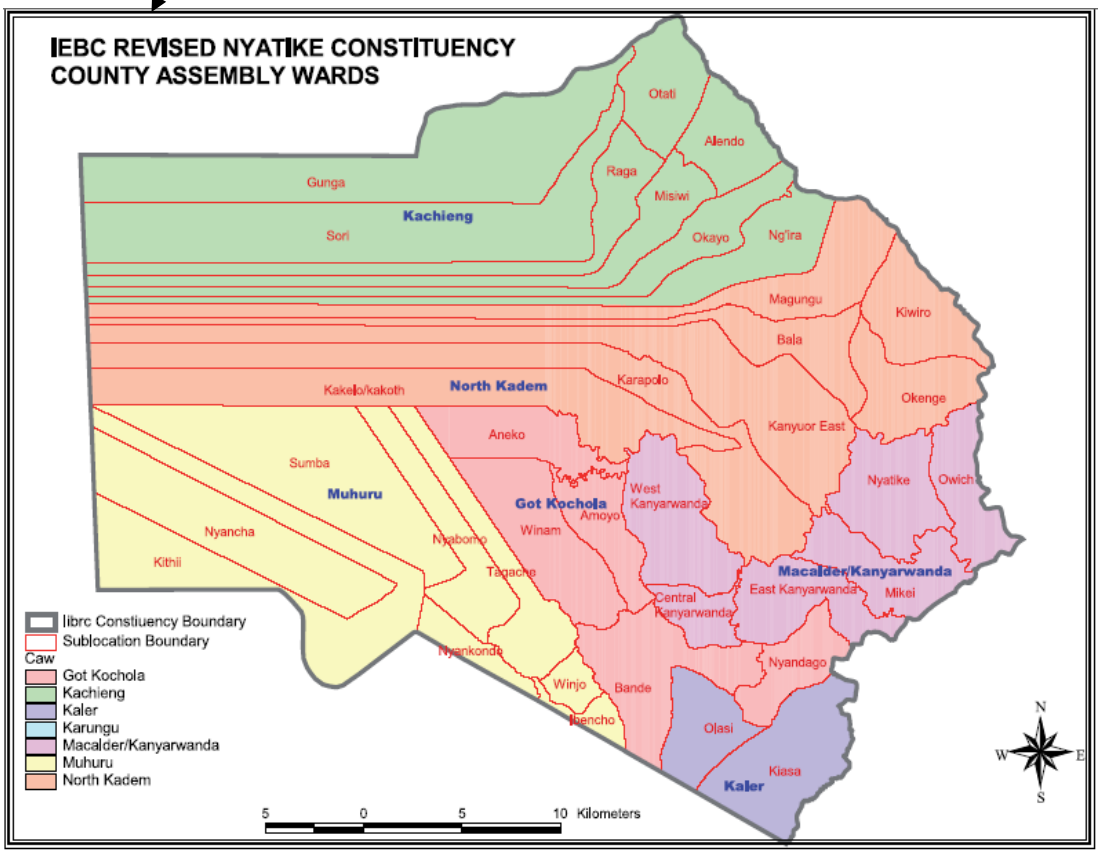

Figure 3.2: Map of Nyatike Sub-county

Source: IEBC. 2017

3.3 Study Design

This was a descriptive cross-sectional survey using mixed-methods approach. Descriptive design is a method of collecting information about people's attitudes, opinions, habits or social issues by interviewing or administering a questionnaire to a sample of individuals (Orodho and Kombo, 2002). It thus provides characteristics of the target population and as a result enhances reliability and generalization of the study outcome. Further, this design was suitable because it involves studying several groups at the same point in time hence a large number of subjects could be studied at a little cost.

3.4 Study Population

The study population is defined as all the items or people under consideration (Orodho, 2003). For this study, the study population was seropositive women in HIV discordant marital relationships in Nyatike Sub-county. The target population was discordant women receiving HIV/FP services at the health care facilities within the sub-county. The age bracket of the participants was between 18 to 49 years. The age bracket was appropriate because these women were within the conventional reproductive period for women. The study also involved fourteen seronegative men in discordant relationships (aged between 18 to 59 years) and fourteen health care providers purposively selected in the health care facilities already identified.

3.5 Sample Selection and Size

Sampling is a process of selecting a number of individuals or objects from a population such that the selected group contains elements representative of the characteristics in the entire group (Orodho and Kombo, 2002). This enables acquisition of information about a large

group by studying a small number of its members. Nyatike Sub-county consists of seven wards: Macalder Kanyarwanda, North Kadem, Got Kachola, Kaler, Karungu, Kachieng' and Muhuru Ward). Fourteen health facilities providing both FP and HIV care services, two from each of these seven wards, were purposefully selected to form part of the study. This purposive sampling of health facilities was based on their patient volume. The two facilities with the highest number of seropositive women in each of the wards were thus selected. This was to ensure adequate geographical representation of the entire sub-county and to ensure access to all individuals included in the sample so as to eliminate systematic bias.

On the quantitative side, the study considered a sample size of 182 seropositive women in discordant marital relationships based on the following formula recommended by Fisher *et al.,* (1998) as quoted in Kothari (2004):

$$n= (Nz^2pq)/e^2(N-1) + z^2pq$$

Where:

n = sample size

N = population size

z = the value of the standard variate that corresponds to some significance level (this is put at 95%, then z = 1.96)

p = the estimated prevalence of dual contraception use for discordant seropositive women. This is put at 50%.

e = the margin of error on p (put at 5%)

q = (1-p)

$n = (344 \times 1.96^2 \times 0.5 \times 0.5)/0.05^2(344-1) + (1.96^2 \times 0.5 \times 0.5)$

$= 330.3776/1.8179$

$= 181.74$

$=182$

Each health facility was purposively allocated 13 participants to enable effective interviews within a short period of time. Prior arrangement was done with facility in-charge in order to get participants as they visit the facility. In-charges of the facilities were taken through the objective of the study and characteristics of participants required that they should help identify. Women who met criteria for research were selected randomly by picking pieces of papers that were written "Yes" or "No", with those picking "Yes" forming part of the study sample after giving informed consent.

On the qualitative side, a total of four FGDs were held in four health facilities (one FGD for each health facility) randomly selected from already sampled fourteen health facilities. Two seropositive women in discordant marital relationships were purposively sampled from each of the fourteen health facilities based on their varied demographic and socio-economic characteristics to participate in the FGDs. The 28 sampled FGDs participants were then divided into four groups of seven participants each. This number was considered appropriate to allow full and active participation of all participants in the discussion within the time available. Secondly, fourteen health care providers in the identified health facilities, one for each health facility, were purposively selected as key informants to take part in the study and were subjected to in-depth interviews. This sample size was appropriate because it ensured

that all the fourteen health facilities were represented. Finally, fourteen (14) seronegative men in discordant marital relationships, one for each health facility, were randomly selected to participate in the study and were subjected to in-depth interviews. Men who met criteria for research were selected randomly by picking pieces of papers written "Yes" or "No", with those picking "Yes" forming part of the study sample after giving informed consent. This number ensured equal representation of all facilities sampled. The inclusion of men was considered fit because use of FP methods is facilitated when couples discuss and agree on the issue (KNBS and ICF macro, 2015).

3.6 Inclusion and Exclusion Criteria

Participants for questionnaire interviews and FGDs were seropositive women in discordant marital relationship for at least 6 months prior to study, aged between 18-49 years, attending the selected health facilities, willing to participate in the study and able to give informed consent. Participants for in-depth interviews were health care providers in the selected health care facilities and seronegative men in discordant marital relationships, aged between 18-59 years, attending selected health care facilities, willing to participate in the study and able to give informed consent. Those women and men who were unable to give informed consent were excluded from the study.

3.7 Study Variables

Dependent variable: Dual contraception preference and prevalence.

Independent variables: Demographic (age and parity) and socio-economic (education and income levels) characteristics.

3.8 Data Collection Instruments

Both quantitative and qualitative data were collected. Quantitative data on dual contraception preference and prevalence among respondents of diverse demographic and socio-economic backgrounds was collected using interviewer administered questionnaire. This instrument was suitable because it involved face-to-face interaction which limited the level of abstractness that could lead to inaccurate results and thus helped in getting in-depth information from the respondents. The interview method enables the researcher to develop good rapport with participants so as to win their trust (Strauss and Corbin 1990), thus encouraging participants to freely express themselves and provide true information (Ndeti, 2013).

Focused group discussion guide was developed to guide face-to-face discussions with seropositive women. It was used to collect cross-cutting qualitative information on the factors affecting dual contraception prevalence and preference among seropositive women in discordant relationships. FGDs were important for this study because it provides a greater span of ideas, opinions and experiences as expressed by participants (Campbell *et al*., 1999). In-depth interview guides were developed to guide face-to-face in-depth interviews with health care providers and seronegative men. They were used to generate detailed qualitative information on factors affecting dual contraception prevalence and preference among respondents of diverse demographic and socio-economic backgrounds and the associated reasons. The above instruments were pre-tested and feedback used to refine them.

3.9 Data Collection Procedures

Prior to data collection, a pilot study involving six seropositive women in discordant marital relationships, three in each of the two purposively selected health facilities was carried out to pre-test the questionnaire. One research assistant for each health facility was recruited and trained on the research objectives, quality control, filling in questionnaire and research ethics before data collection process. They were further taught on how to provide assistance to study participants when required. The research assistants were persons who had long experience in working with HIV infected individuals. They collaborated with respective health facility providers to identify study participants. The study was conducted during the routine health facility visits by participants with all interviews and FGDs taking place in a private room at the respective health facilities with assurance of confidentiality. They were conducted in the respondent's own language.

During the actual data collection, interviews with seropositive women followed a rigid procedure laid down. Interviewers asked questions in a form and order prescribed in the questionnaire that had been validated in a pilot study. This inflexibility of the questionnaire interviews was to enhance comparability of one interview and another and ease data analysis.

Four FGDs were conducted, each consisting of seven discussants in the four health facilities selected. Each discussion took 45-60 minutes and was guided by FGD guide. The researcher acted as a moderator to ensure that all participants contributed their ideas. Hand written notes were taken during the dialogues, from which a detailed report was written at the end of each FGD.

Twenty eight (28) in-depth interviews with seronegative men in discordant marital relationships and health care providers were conducted by the researcher in English or local language depending on the language the interviewee was comfortable with and notes taken. The health care providers (key informants) were asked the same questions to enhance reliability.

3.10 Method of Data Analysis

3.10.1 Quantitative Data Analysis

The quantitative data obtained from questionnaire interviews were analyzed descriptively and presented using frequency tables. Crosstabs were used to cross-tabulate independent and dependent variables to describe the data proportionally. Further, inferential statistics involving Chi-square test and Regression analysis were also used to analyze data. The chi-square test was appropriate because it tests the relationship between two categorical variables where one is dichotomous, a condition satisfied by the study variables. The logistic regression analysis was used to help build an association model using the four predictor variables (age, parity, level of education and level of monthly income) to predict the likelihood that seropositive women of particular demographic or socio-economic background will prefer using dual contraception. The model was then used to derive estimates of the odds ratios for each of the independent variable in the model. This tool was suitable for this study because it is useful for predicting the presence or absence of a characteristic or outcome based on values of a set of predictor variables. In addition, it is suited to models where the dependent variable is dichotomous. These analyses were done using Statistical Package for Social Sciences (SPSS) version 20.0 2007. A probability value of <0.05 was considered significant.

3.10.2 Qualitative Data Analysis

Qualitative data was analyzed using content analysis. Related data from FGDs and in-depth interviews were categorized thematically, summarized and analyzed based on study objectives. This method aided in making descriptions and interpretations of the content of text data as well as to summarize emerging issues. This method was chosen for this study because of its flexibility in analyzing text data.

3.11 Method of Data Presentation

The quantitative data was presented using frequency tables to show the frequencies and percentage proportions in each category of categorical variables. Cross-tabulation tables were used to present cross-tabulated data for independent and dependent variables. Qualitative data was presented using content descriptions/narrative method.

3.12 Ethical Considerations

Permission to carry out the research was obtained from the board of post graduate studies of Rongo University. A research permit was then sought from the National Commission for Science, Technology and Innovation (NACOSTI). Permission to carry out research within the Sub-county was obtained from County Commissioner, Migori County; County Director of Education, Migori County; Sub-county Commissioner, Nyatike; MoH Nyatike Sub-county, and administrative authorities of the sampled health care facilities. Trained research assistants obtained individual written informed consent from respondents prior to their involvement in data collection. Responses given by the respondents were treated with utmost confidentiality and participant anonymity was ensured. Participation by the respondents was voluntary and

no respondent was coerced to answer any questions they did not want to answer. Finally participants had a right to withdraw from the interview at any time without penalty.

3.13 Methodology Matrix

Objectives	**Data type**	**Collection instruments**	**Technique of analysis**	**Techniques of presentation**
Dual contraception prevalence	Quantitative	Questionnaire interviews	Calculating percentages and frequencies	Frequency tables
	Qualitative	FGDs and In-depth interviews	Content analysis	Thematic descriptions
Most common form of dual contraception	Quantitative	Questionnaire interviews	Calculating percentages and frequencies	Frequency tables
	Qualitative	FGDs and In-depth interviews	Content analysis	Thematic descriptions

Demographic factors and dual contraception preference	Quantitative	Questionnaire interviews	Cross-tabulation, Chi-square tests and binary logistic regression.	Crosstabs and Logistic regression tables
	Qualitative	FGDs and In-depth interviews	Content analysis	Thematic descriptions
Socio-economic factors and dual contraception preference	Quantitative	Questionnaire interviews	Cross-tabulation, Chi-square tests and binary logistic regression.	Crosstabs, and Logistic regression tables
	Qualitative	FGDs and In-depth interviews	Content analysis	Thematic descriptions

Source: Field Survey, 2017

CHAPTER FOUR

FINDINGS, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study. The main objective of the study was to establish factors affecting dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub-county, Kenya. The study had four specific objectives which included: To find out dual contraception prevalence among seropositive women in discordant marital relationships; to determine the most common form of dual contraception used to offer dual protection among seropositive women in discordant marital relationships; to establish the association between demographic factors and dual contraception preference; and, to establish the association between socio-economic factors and dual contraception preference among seropositive women in discordant marital relationships in Nyatike Sub-county, Kenya.

4.2 Response Return Rate

The study targeted a total of 182 seropositive women to be subjected to interviewer administered questionnaire, 28 seropositive women as focus group participants and 28 in-depth interviewees (14 health care providers as key informants, and 14 seronegative men in discordant marital relationships). Out of the 182 survey respondents identified, 140 (76.9%) were interviewed as soon as they arrived at the facility for their normal visits after signing consent forms whereas 42 (23.1%) were booked for interviews at later dates within their respective health facilities. They requested to be interviewed at later dates because of their commitment. Among respondents that requested to be interviewed at later dates, 34

(representing 18.7 % of the entire sample size) were interviewed while 8 accounting for 4.4% declined to participate in the study. The respondents who declined to participate in the study were spread across 5 health facilities as follows: i) three health facilities had 2 participants each; and ii) two health facilities had one participant each. Reasons for non participation included failure to show up during scheduled interview dates and deliberate refusal citing privacy. This left a total of 174 (95.6 %) respondents who were subjected to interviewer administered questionnaire. All the four focus group discussions and twenty eight in-depth interviews were conducted in the study.

4.3 Background Characteristics of the Respondents

The demographic and socio-economic characteristics of seropositive women in discordant marital relationships considered for this study included age, parity, level of education and level of monthly income. A total of 174 seropositive women were included in the study as survey sample. Majority 85 (48.9%) of the respondents surveyed were aged between 18-29 years followed by those aged between 30-39 years 64 (36.8%), an indication of a possible high prevalence of HIV discordance among younger women in their 20s compared to their older counterparts. Most (82) seropositive women surveyed had either two or three children followed by those who had four or more children (51) and those with zero or one child (41) accounting for 47.1%, 29.3% and 23.6% respectively.

More than half (113) of the respondents had primary education representing 64.9% of the samples. Those who had secondary, tertiary and no education were 32, 15 and 14 representing 18.4%, 8.6% and 8.0% respectively. While many respondents had primary education, this

number steadily decreased though secondary and tertiary levels of education, perhaps a reflection of high drop-out rates in the study area. The monthly income levels of the women were so low with over 62% earning not more than Ksh.5000 a month, an indication of a widespread low socio-economic status in the study area. Table 4.1 summarizes the background characteristics of respondents.

Table 4.1: Background Characteristics of Respondents (n = 174)

Variables		**Frequency (n)**	**Percent (%)**
Age	18-29	85	48.9
	30-39	64	36.8
	40-49	25	14.4
Number of children	0-1	41	23.6
	2-3	82	47.1
	≥4	51	29.3
Level of Education	None	14	8.0
	Primary	113	64.9
	Secondary	32	18.4
	Tertiary	15	8.6
Level of Monthly Income	Ksh.0 - 5,000	108	62.1
	Ksh.5,001- 10,000	43	24.7
	Over Ksh.10,000	23	13.2

Source: Field Survey, 2017

4.4 Dual Contraception Prevalence

To assess dual contraception prevalence, survey respondents were asked if they had used dual contraception within the last 6 months prior to the study to offer dual protection against unwanted pregnancy and HIV/STIs and the consistency of use for those who reported using. Those not using dual contraception were categorized into those using condoms only, those using modern contraceptives minus condoms and those using traditional methods. The survey revealed that slightly more than half of the seropositive women in discordant marital relationships surveyed had used dual contraception to offer dual protection against unwanted pregnancy and HIV/STIs transmission to uninfected partner in the last six months prior to the study. Out of the 174 samples, 90 (51.7%) had applied dual contraception against 84 (48.3%) who had not as evident in Table 4.2.

Table 4.2: Summary of Dual Contraception Users and Non-Users

Dual Contraceptive Use (n = 174)		**Frequency**	**Percent**
Yes n = 90 (51.7%)	Consistently (Every time of sexual intercourse)	51	29.3
	Rarely (non-consistently)	39	22.4
No n = 84 (48.3%)	Condoms only	61	35.1
	Contraceptive minus condoms	3	1.7
	Traditional methods	20	11.5
Total		174	100.0

Source: Field Survey, 2017

However, out of the 90 (51.7%) respondents who reported to have used dual contraception in the last six months, 51 (29.3%) stated that they did so every time of sexual intercourse, and therefore consistently whereas 39 (22.4%) stated that they applied dual contraception inconsistently. Even though the reported use of dual contraception was high possibly because the study participants had undergone couple HIV testing and counseling which facilitated disclosure of HIV serostatus, the consistent use of dual contraception was low. This is an indication of a low dual contraception prevalence of 29.3% among the study participants despite double risk of HIV transmission to uninfected partner and unintended pregnancy. Further analysis indicates that 53.4% and 86.8% of respondents used non-barrier contraceptives and condoms respectively.

Respondents who reported consistent use of dual contraception cited their need to protect their male partners from HIV infection and prevention of unplanned pregnancy. However, opposition by husband, need for a child, perceived side effects of contraceptives, cultural and religious beliefs prohibiting use of modern contraceptives, diminished sexual urge due to advanced age and illness were reasons given by respondents who inconsistently used dual contraception. Admitting not using dual contraception consistently, one woman interviewee stated:

"I use condoms inconsistently. It is my husband who decides when to use a condom.... When I suggested that we use a condom, he complained and suggested that I possibly was unfaithful. I use injections too, secretly." ***(QI-Seropositive woman, Nyatike sub-County).***

Of the 84 (48.3%) survey respondents who did not use dual contraception, 61 (35.1%) used only condoms for dual protection, 3 (1.7%) used modern contraceptives minus condoms and 20 (11.5%) used traditional methods for pregnancy prevention. Respondents who used condoms only for dual protection were higher than those using dual contraception consistently. They noted that use of condoms plus other contraceptives amounted to duplication of duties as condoms alone could be used to prevent both unplanned pregnancy and HIV transmission. Further, several side effects related to use of modern contraceptives, especially hormonal contraceptives including excessive bleeding, abdominal pain, severe backache, loss of sexual urge, infertility and perceived fetus deformity informed their non-use of modern contraceptives with condoms.

Majority of respondents who used traditional methods used withdrawal and calendar methods. They attributed this to ignorance about dual contraception use, lack of experience with modern contraceptives, fear of being barren and the belief that use of modern contraceptives among seropositive women aged 45 years and above was a waste of time since they are in their menopause stage. They further expressed that male condoms irritate and caused rushes on their private parts. In this regard, three women interviewees stated:

"I have not used any contraceptive. I was ignorant of the available contraceptives and their use when I was younger. Now I am menopausal and don't use contraceptives." ***(QI-Seropositive woman, Nyatike sub-County).***

"Being 45 years old, I don't use any contraceptive because it is impossible to conceive at my age. Condoms irritate too." ***(QI-Seropositive woman, Nyatike sub-County).***

"I have no children and seriously need a baby; I don't want to die childless, that is why I don't use any method. I may be barren." ***(QI-Seropositive woman, Nyatike sub-County).***

Despite high prevalence level of condom use among survey respondents (86.8%), opposition by spouse emerged as a major barrier to condom use among respondents who reported using dual contraception inconsistently, contraceptives minus condoms and traditional methods. They reported that most of their husbands were opposed to the use of condoms quoting several reasons such as fear of their female partners being promiscuous, less sexual satisfaction, pain associated with small sized condoms, not used to condoms, cultural and religious beliefs and the belief that condom causes cervical cancer. Further it was noted that many husbands believed that so long as their partners were on ARV medication, their chances of being infected were minimal due to viral load suppression, thus neglecting the use of condoms. One of the women interviewee explained:

"My husband said that using condom is equivalent to authorizing me to be promiscuous ... and that so long as I am consistently taking my ARV drugs, he cannot be infected because my viral load will be constantly suppressed." ***(QI-Seropositive woman, Nyatike sub-County).***

Further interrogation of this subject in focus group discussions revealed that the majority of women had used dual contraception to offer dual protection in the last six months prior to the study, with few reporting to have used it consistently to prevent both unwanted pregnancy and spread of HIV to uninfected partner. Explaining their reasons for consistent use of dual contraception, three of the women discussants asserted:

"I have used condom together with implants to effectively protect my husband against HIV infection and to avoid unwanted pregnancy." ***(FGD-Seropositive woman, Nyatike sub-County).***

"I am in a polygamous family and am the only HIV positive member. I don't want to spread the infection to my husband and co-wives and so we use condoms consistently. I also have an implant just in case something goes wrong." ***(FGD-Seropositive woman, Nyatike sub-County).***

"I use dual contraceptives consistently because my co-wife ran away and left us with three children. I also have five children. This burden is too much so we don't want another child." ***(FGD-Seropositive woman, Nyatike sub-County).***

Minority of FGDs respondents who reported not using dual contraception gave reasons similar to sample survey respondents such as need for a child, side effects of modern contraceptives, opposition by husband, cultural/ religious beliefs and advanced age associated with diminished sexual urge. In support of these views, two of the women discussants explained:

"My husband doesn't use condoms completely. He fears touching condoms claiming that they cause infections ... (and that) a rash will develop in his private part." ***(FGD-Seropositive woman, Nyatike sub-County).***

"Currently I am 45 years old. We rarely have sexual intercourse and even so never use contraceptives since I am past child bearing age. I experience a lot of pain when we have intercourse ....condoms irritate." ***(FGD-Seropositive woman, Nyatike sub-County).***

These findings were upheld by the majority of the husbands to seropositive women who noted that their partners use dual contraception to prevent bearing more children and HIV infection. Conversely, few husbands who stated that their spouses do not use dual contraception cited the need for children and desire for sensation. One of the men stated in this regard:

"We don't consistently use dual contraception because we are only one year into our marriage and we would like to enjoy our conjugal right with utmost intimacy. We are also under pressure from members of our extended family to have children." ***(IDI-Seronegative man, Nyatike sub-County).***

Even responses from the health care providers interviewed further revealed that there is generally low dual contraception prevalence among seropositive women in discordant marital relationships. They said that majority of seropositive women don't use dual contraception consistently. They attributed this to their desire to have more children as evidenced by high pregnancy rates among them, desire for sensation causing inconsistent use of condoms, husband refusal, side effects of some modern contraceptives and low levels of education resulting in low understanding and acceptance of dual contraception use.

Even though the findings of this study indicates a low prevalence of dual contraception (29.3%), it is slightly higher than in other studies; 23% in Brazil (Tsuyuki *et al*., 2003), 22% in South Africa (Moroni *et al*., 2007), 25% in India (Chakrapani *et al*., 2011), 27.2% in Nigeria (Lewani *et al*., 2014), 28% in Kenya (Antelman *et al*., 2015) and 15.7% in Ethiopia (Gebrehiwot *et al.*, 2017). The high dual contraception prevalence observed in this study may be due to its focus on seropositive women in discordant relationships as opposed to these previous studies that were based on the entire population of seropositive women. Studies have shown that seropositive women in discordant relationships have greater odds of using dual contraception than their counterparts in sero-concordant relationships as well as those whose partner's HIV status are not known (Gebrehiwot *et al.*, 2017).

It is however lower than 34% reported among seropositive women in Thailand (Munsakul *et al.*, 2016), 38% in Zimbabwe (Magwali *et al.*, 2005), 34% in Namibia (Antelman *et al*., 2015), and 38.5% in Bungoma County in Kenya (Mulongo *et al.*, 2017). This is so because the previous studies did not focus on the consistency of dual contraception use. Other studies have found that consistent use of condoms may lead to decrease in use of modern contraceptives and vice versa (Haddad *et al*., 2015). This is a potential cause of the observed high inconsistent use of dual contraception among the study participants (22.4%), perhaps due to discontinuation of either condoms or modern contraceptives and evidently justifies their belief of duplication of duties.

Further, whereas ignorance about modern contraceptives observed among respondents points to the fact that most HIV testing and counseling programs focus exclusively on condom use without discussion on more effective contraceptive methods for pregnancy prevention (Grabbe *et al*., 2008), the observed partner refusal reflects gender-related power differentials with men being the main decision makers in matters of sexuality thus hinting to the need for health programs tailored towards enhancing partner communication on family planning as noted by Okigbo *et al*. (2015). However the prevalence of modern contraceptives (53.4%) observed is almost equivalent to 53% prevalence of modern contraceptive in Kenya (KNBS and ICF macro, 2015), perhaps due to persistent health talks by health service providers to scale-up contraceptive uptake in the study area. The observed high use of male condoms (86.8%) corroborate the findings in South Africa (Oni *et al*., 2003) and Thailand (Munsakul *et al.,* 2016) where 71% and 87.7% seropositive women reported using male condoms respectively. Inadequate knowledge on female condoms may justify its total non-use among the study participants. Personal desire for biological child, real and perceived side effects of modern contraceptives, religious/cultural beliefs and non-acceptance of condoms in marriages were the main barriers to dual contraception use and were consistent with findings in other studies (Chakrapani *et al*., 2011; Gebrehiwot *et al.,* 2017; Mulongo *et al.,* 2017).

4.5 Most Common Form of Dual Contraception

To determine the most common form of dual contraception used, respondents who reported to have used dual contraception were asked the type of modern contraceptive they used together with condoms to offer dual protection against HIV transmission to uninfected partner and unintended pregnancy. Of the 90 (51.7%) survey respondents who reported using dual contraception, majority 42 (24.1%) used injectables + condoms, 33 (19.1%) used implants +

condoms, 6 (3.4%) used IUDs + condoms, and 6 (3.4%) used sterilization + condoms. Only 3 (1.7%) respondents used pills together with condoms, an indication that it was the least form of dual contraception used among the survey respondents. The missing system represents the 84 (48.3%) respondents who did not use dual contraception as shown in Table 4.3.

Table 4.3: Most Common Form of Dual Contraception

		Frequency	Percent	Valid Percent	Cumulative Percent
	Condoms + Injectables	42	24.1	46.7	46.7
	Condoms + Implants	33	19.1	36.7	83.3
	Condoms + IUDs	6	3.4	6.7	90.0
	Condoms + Sterilization	6	3.4	6.7	96.7
	Condoms + Oral pills	3	1.7	3.3	100.0
	Total	90	51.7	100.0	
Missing	System	84	48.3		
Total		**174**	**100.0**		

Source: Field Survey, 2017

Combination of condom and injectables was most used because injectables offered privacy especially among seropositive women whose husbands opposed the use of modern contraception, induced less pain during injection and was effective in pregnancy prevention. Many women who reported husband's refusal to any form of modern contraception opted to use injectables secretly. Two of the woman respondents who used injectables stated:

"I used implants secretly. When my husband realized, he got angry. I stopped and am now using injectables covertly because he cannot detect that I am using it. We use condoms too." ***(QI-Seropositive woman, Nyatike sub-County).***

''I visit the clinic after three months to get my ARVs and that is also when I get the injections that are administered every three months. My husband can't detect because he thinks I only go for HIV clinics to get ARVs." ***(QI-Seropositive woman, Nyatike sub-County).***

The respondents who used implants cited its effectiveness and long term pregnancy prevention. They said that once inserted, it takes 3-5 years before going back to health facilities for FP services. In explaining her preference for implant, one woman stated:

"I prefer implant because it takes a longer period compared to pills and injectables." ***(QI-Seropositive woman, Nyatike sub-County).***

On the other hand, minority respondents who didn't use injections and implants cited side effects including excessive bleeding, severe backache, stomachache/abdominal pain, tiredness interfering with domestic chores, loss of sexual urge interfering with their marital sexual obligation, and the belief that they deform fetus and cause infertility. It was further noted that implants were easy to detect by male partners through simple touch, involved some cost during insertion and removal and was believed to cause cancer. Regular visits to health facility for re-injection made injectables unpopular among respondents who used other methods.

Both sterilization and IUDs were less used on equal measure (each 3.4% of survey respondents), possibly because sterilization was associated with permanent inability to conceive hence was unpopular among women who still needed more children. On the other hand, non-availability of IUDs in many health facilities especially dispensaries coupled with detection by spouse during sexual intercourse were noted to compel clients to opt for other readily available contraceptive methods that were easy to use covertly. Further, IUDs were believed to cause cervical cancer, disappear into the womb and that its insertion was a total embarrassment to some respondents. In regard to this, one woman said:

"I don't prefer IUDs because of where it is placed. It embarrasses especially when a male doctor does the insertion." ***(QI-Seropositive woman, Nyatike sub-County).***

Similar to implants, the minority respondents who used IUDs argued that it takes longer period, for instance 12 years thus one does not waste time visiting health facility frequently for FP services. On the same note, respondents who used condoms together with sterilization (tubal ligation) either noted that they have attained their desired family sizes or sought a permanent solution to potential health complications associated with pregnancy. In support of sterilization, two of the interviewees had these to say:

"I wanted to stop giving birth completely because I had complications during my first and second pregnancy. My uterus blocked my urinal tract. I had to be operated." ***(QI-Seropositive woman, Nyatike sub-County).***

"I went for sterilization because I felt we had enough children." ***(QI-Seropositive woman, Nyatike sub-County).***

Pills were the least used modern contraceptive with condoms because it created pill burden among dual contraceptive users as their health conditions also required prompt adherence to ARVs drugs. In addition, some respondents reported that pills could be detected by their spouses resulting in domestic violence. To this extent, one of the women interviewees explained:

"I don't prefer pills. It is difficult to take contraceptive pills together with ARV drugs on daily basis." ***(QI-Seropositive woman, Nyatike sub-County).***

The total none use of vasectomy, as reported by respondents, could be because it was unpopular among the husbands to seropositive women, coupled with the fact that it is male controlled.

Further interrogation of this subject in focus group discussions revealed that majority of seropositive women used injectables followed by implants as the appropriate contraceptives with condoms. The two methods were used based on ease of management, privacy, long term effectiveness, lessening of pill burden and compatibility with the body. To this extent, two women explained:

"I use implants because it offers a longer term solution to contraception, does not increase the burden of taking pills, and does not cause serious side effects on me unlike pills." ***(FGD-Seropositive woman, Nyatike sub-County).***

"I use injection because it is secret, easily manageable, does not affect me seriously and most importantly affords me the secrecy I need. My husband is opposed to modern contraceptives

and says he'll divorce me if he realizes that I use them." ***(FGD-Seropositive woman, Nyatike sub-County).***

Minority of FGD participants reported using condoms together with pills, IUDs and sterilization, citing side effects associated with implants and injections. Contrary to survey findings, majority of the husbands to seropositive women interviewed revealed high use of implants with condoms and condom use alone for dual protection among their spouses. This perhaps hints to the fact that many husbands to seropositive women have no idea regarding the contraceptive method used by their partners in conjunction with condoms to offer dual protection. More specifically, they are ignorant on the secret use of injectables by their seropositive wives.

The findings from the interviews featuring health care providers were greatly reflective of the findings of the survey with regard to the most common form of dual contraception for dual protection with majority of healthcare providers stating that many seropositive women used injection plus condoms. They further noted that the use of implants with condoms was on the rise probably because of longer term benefits of pregnancy prevention associated with implants. In an attempt to explain this trend, one health provider interviewee asserted:

"Most of the women we attend to here use injections because it offers them the secrecy they need against their husbands who are opposed to the use of modern FP method but accepts only condoms for dual protection." ***(KI-Healthcare provider, Nyatike sub-County).***

The health care providers attributed the low use of IUDs, sterilization and oral pills with condoms among survey respondents to absence of IUDs and sterilization services in most dispensaries, cost of insertion and sterilization as well as transport cost to a distant facility where the services are provided. Similarly they linked low use of pills to pill burden, advice by health providers on use of long-term methods and husband refusal.

This result is consistent with findings of other studies in South Africa (Oni *et al*., 2013), South East Nigeria (Lewani *et al*., 2014), Ethiopia (Gebrehiwot *et al.,* 2017), Namibia, Tanzania and Kenya (Antelman *et al*., 2015) and Kenya (Mulongo *et al.,* 2017) that have also found condom plus injectables as the most commonly used form of dual contraception. The findings of the present study however contradicts the findings in India (Chakrapani *et al.,* 2011) and Thailand (Munsakul *et al.,* 2016) where condom plus sterilization were the most common form of dual contraception used. The observed difference is possibly a consequence of widespread access to sterilization in Thailand and India compared to African countries. Ease of management, privacy and partner refusal cited by respondents as major reasons for widespread adoption of injections are in line with findings in Ethiopia (Gebrehiwot *et al.,* 2017) and Bungoma County in Kenya (Mulongo *et al.,* 2017). Seropositive women whose husbands disapproved contraceptive use resorted to use injectables covertly.

Whereas the proportion of seropositive women using oral pills plus condoms were comparably higher than their counterparts using implants plus condoms in South East Nigeria (Lewani *et al*., 2014), the present study shows high use of implants (19.1%) compared to oral

pills (1.7%) among dual contraception users. This could be due to the fact that there is rising usage of long acting FP methods among couples in East Africa (Izugbara *et al.,* 2018) as a result of health care providers' active promotion of use of long term contraceptives in the region. Further, the low use of IUDs with condoms had also been noted in India (Chakrapani *et al.*, 2011) and was linked to fear of detection by husbands as noted in the present study.

4.6 Bivariate Analysis of Demographic Factors affecting Dual Contraception Preference

To determine demographic factors affecting dual contraception preference, respondents' age and number of living children were used for analysis. Survey respondents were asked if they prefer using dual contraception. Bivariate analysis involving cross tabulation of predictor and outcome variables to indicate proportion of preferences for each category and chi-square tests to show statistical significance of association was performed. Information from FGDs and In-depth interviews were used to corroborate survey results.

Generally, of the 174 survey respondents, 110 representing 63.2% preferred using dual contraception compared to 64 (36.8%) who did not prefer. These results indicate a higher proportion of seropositive women preferring to use dual contraception compared to the proportion who reported using dual contraception consistently 51 (29.3%). Among the 110 seropositive women who preferred to use dual contraception, 85 (77.3%) reported using dual contraception while 25 (22.7%) did not use because of partner refusal, real side effects of modern contraceptives and desire for biological child. Further, of the 64 seropositive women who did not prefer to use dual contraception, majority 59 (92.2%) did not use dual

contraception while only 5 (7.8%) reported using, an indication that preference for dual contraception strongly influences its ultimate use.

Table 4.4: Dual Contraception Preference

		Dual Contraception Use		Total
		No	Yes	
Dual Contraception Preference	Yes	25 (22.7%)	85 (77.3%)	110 (63.2%)
	No	59 (92.2%)	5 (7.8%)	64 (36.8%)
	Total	**84 (48.3%)**	**90 (51.7%)**	**174(100.0%)**

Source: Field Survey, 2017

4.6.1 Age and Dual Contraception Preference

To establish the link between age and dual contraception preference, cross tabulation and chi-square analyses were performed. Information from FGDs and In-depth interviews were used to corroborate survey results. An evaluation of the cross tabulated results of age versus dual contraception preference revealed that across the age categories, the proportion who preferred to use dual contraception were notably higher than the proportion who did not except for age group 40-49 years as can be seen from Table 4.5.

Table 4.5: Cross-Tabulation of Age and Dual Contraception Preference

Age	Dual Contraception Preference			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
18-29	61	71.80	24	28.20
30-39	37	57.80	27	42.20
40-49	12	48.00	13	52.00
Total	110	63.20	64	36.80

0 cells (0.0%) have expected count less than 5. $X^2 = 5.964$; df=2; p=0.051,

N=174. No missing case. Test statistically significant at $p < 0.05$.

Source: Field Survey, 2017

The proportion of seropositive women who preferred using dual contraception was highest among those aged between 18-29 years (71.8%), followed by those aged between 30-39 years (57.8%), and finally those aged between 40-49 years who reported the least proportion (48.0%). Therefore the proportion of seropositive women aged between 18-29 years who preferred dual contraception is 14% and 23.8% greater than those aged between 30-39 and 40-49 years respectively. Similarly the percentage of seropositive women aged between 30-39

years who prefer using dual contraception is 9.8% greater than those aged between 40-49 years who prefer dual contraception.

The proportion of seropositive women who did not prefer dual contraception was 52% among those aged 40-49 years. However this proportion decreased to 42.2% among those aged 30-39 years and finally to 28.2% among those aged 18-29 years. This indicates a possible negative association between age and dual contraception preference.

Further analysis of the crosstab table reveals that the odds that seropositive woman aged 18-29 years prefer using dual contraception is 61/24 = 2.542 while the odds that seropositive woman aged 30-39 years prefer using dual contraception is 37/27 = 1.370. Women aged 40-49 had the least odds of preferring dual contraception (12/13 = .923). Thus the odds that seropositive woman aged 18-29 years prefer dual contraception is (2.542/1.370) = 1.855 and (2.542/.923) = 2.754 times greater than the odds that their counterparts aged between 30-39 and 40-49 years prefer dual contraception respectively. Similarly, the odds that seropositive women aged 30-39 years prefer using dual contraception is (1.370/.923) = 1.484 times the odds that their counterparts aged between 40-49 years prefer dual contraception. This analysis of odds indicates that the odds of preference for dual contraception were highest among seropositive women age 18-29 years and least among those aged 40-49 years, hinting to a possible negative link between age and dual contraception preference.

However the overall chi-square test indicates that there is no statistically significant association between age and dual method contraceptive preference, $X^2(2, N = 174) = 5.964$, $p = 0.051$ and that the observed differences in preference proportions are due to chance.

Contrary to survey findings indicating no statistical significant association, further probing of the subjects in FGDs revealed that age had a relationship with dual contraception preference. Majority of women held the view that younger women preferred to use dual contraception for dual protection because they were more informed compared to their older counterparts, feared transmitting HIV to their uninfected husbands, adhered to HIV counseling possibly because they report recent HIV diagnosis, bowed less to cultural and social pressure and appreciated the high cost of living thereby attempting to avoid overburdening themselves with children. In this regard, one woman asserted:

"Younger women prefer using dual contraception because of fear associated with recent diagnosis of HIV infection and HIV transmission to their uninfected partner. Being more informed, they prefer using condoms consistently and are subject to fewer myths about contraceptives." ***(FGD-Seropositive woman, Nyatike sub-County).***

They argued that women in their middle ages tend to use long term modern contraceptives for pregnancy prevention more than condoms for HIV/STIs prevention because they believe that consistent use of ARVs suppresses their viral load to undetectable levels hence no need of using condoms. They also bowed too much to cultural and religious beliefs. They further agreed that older women aged 40 and above may not prefer dual contraception because they

believe they cannot bear more children and therefore see no need to use contraceptives to prevent unwanted pregnancies other than condoms.

Minority of the women held contrary opinion that younger women do not to prefer using dual contraception because younger, newly married women need children and sexual satisfaction, a belief unanimously upheld by all the husbands to seropositive women interviewed. They noted high parity among older women as a reason for their preference for dual contraception. To this extent, one woman asserted:

"I think younger women do not prefer to apply dual contraception as much as women in their middle ages because they are mostly newly married and have not had the number of children they desire." ***(FGD-Seropositive woman, Nyatike sub-County).***

Further, contrary to survey findings, healthcare providers unanimously agreed that younger seropositive women prefer using dual contraception because they are highly educated than their older counterparts, focus more on their career and fear transmitting HIV to their uninfected partners due to fear associated with post-serostatus disclosure. The older women on the other hand were seen to prefer using modern contraceptives consistently to avoid or to delay pregnancy as opposed to condoms probably because they bowed too much to cultural and religious beliefs that prohibit condom use among married couples. In this regard, two of the healthcare provider interviewees explained:

"When younger couples are tested and found to be discordant, they tend to have much fear about their health than older couples and as a result tend to adhere to post test HIV counseling through consistent use of ARV drugs and dual contraception for both pregnancy delay and protection against HIV transmission." ***(KI-Healthcare provider, Nyatike sub-County).***

"Most of younger seropositive women are educated and enlightened than their older counterparts hence tend to adhere to health talks on use of dual contraception. Most aged women, having attained their desired number of children, prefer three-year implants while few go for tubal ligation (TL) for pregnancy prevention but inconsistently use condoms." ***(KI-Healthcare provider, Nyatike sub-County).***

They however argued that their preference may not necessarily translate into use because most of their husbands are opposed to contraceptives and more specifically the use of condoms probably because of need for intimacy, children and fear of infidelity. This is a reflection of the inability of women to insist on condom use because they are culturally weak. One healthcare provider explained:

"Most men who are newly married are opposed to the use of condoms claiming it reduces sexual pleasure and promotes infidelity. They too are opposed to modern contraceptives, forcing most women to use injections which are not easy to detect." ***(KI-Healthcare provider, Nyatike sub-County).***

It was further noted that age alone could not predetermine preference for dual contraception use. One healthcare provider explained:

"Aged women with completely no children don't use dual contraception. If they can get pregnant, they would rather have extramarital sex without using condoms or other family planning methods than stay contented with their current state of parity." ***(KI-Healthcare provider, Nyatike sub-County).***

Whereas studies in USA (Eisenberg, 2012), Australia (Higgins and Cooper, 2012), South Africa (Moroni *et al*., 2007), Namibia, Tanzania and Kenya (Antelman *et al*., 2015) and Ethiopia (Gebrehiwot *et al.,* 2017) noted significant negative association between age and dual contraception use, other studies in Canada (Patterson *et al.,* 2014) and Thailand (Munsakul *et al.,* 2016) found that older age increases odds of dual contraception use among sexually active seropositive women. The focus of these previous studies on dual contraception use but not preference particularly among seropositive women in discordant marital relationships makes the findings of this study unique.

This study has found that odds of dual contraception preference among seropositive women in discordant marital relationship decreased with increase in age, that is, the younger age increases the odds of preference for dual contraception while the older age decreases the odds of preference for dual contraception. This could be so because the younger seropositive women are more enlightened, bow less to cultural norms and report shorter duration of HIV diagnosis as noted in Kenya, Namibia and Tanzania (Antelman *et al*., 2015). However, the

study found no statistical significant association between the two variables, perhaps because all seropositive women in discordant marital relationships are faced with similar dual problem of preventing both unwanted pregnancy and HIV/STIs transmission to uninfected partner. The main reasons cited for non-preference such as side effects, spouse refusal, cultural beliefs and need for children have also been noted to decrease odds of dual contraception use in India (Chakrapani *et al*., 2011), Nigeria (Lewani *et al.,* 2014), Ethiopia (Gebrehiwot *et al.,* 2017) and Kenya (Mulongo *et al.*, 2017).

4.6.2 Parity and Dual Contraception Preference

To establish the link between parity and dual contraception preference, cross tabulation and chi-square analyses were performed. Information from FGDs and In-depth interviews were used to corroborate survey results.

A cross tabulation of number of children against preference for dual contraception revealed that the proportion of seropositive women who did not prefer dual contraception was high among those having none or one child (61%) compared to the proportion who preferred (39%). However, dual contraception preference was generally higher among respondents who reported having more than one child. Out of the 82 respondents who reported having either two or three children, 59 (72%) preferred dual contraception while only 23 (28%) preferred otherwise. Similarly, 35 (68.6%) of women who reported having four or more children preferred dual contraception as opposed to only 16 (31.4%) who did not prefer.

Further, the proportion of seropositive women who preferred dual contraception was highest among those reporting two or three children (72%) followed by those reporting four and above children (68.6%) and finally the least among those reporting none or one child (39%). Therefore the percentage of seropositive women having two or three children who preferred dual contraception is 33% and 3.4% greater than those reporting none or one child and four and above children respectively as shown in Table 4.6.

Table 4.6: Cross-Tabulation of Parity and Dual Contraception Preference

Number of children	**Dual Contraception Preference**			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
0-1	16	39.00	25	61.00
2-3	59	72.00	23	28.00
4 and Above	35	68.60	16	31.40
Total	**110**	**63.20**	**64**	**36.80**

0 cells (0.0%) have expected count less than 5. $X^2 = 13.652$; df=2; p=0.001, N=174.

No missing case. Test statistically significant at $p < 0.05$.

Source: Field Survey, 2017

Further still, analysis of the crosstab table reveals that the odds that seropositive woman having two or three children prefer using dual contraception is high (59/23 = 2.565) followed by the odds that seropositive woman having four and above children prefer using dual contraception (35/16 = 2.188). Women having none or one child had the least odds of preferring dual contraception (16/25 = .64). This analysis of odds indicates that the odds of preference for dual contraception was least among seropositive women having none or one child compared to seropositive women having two and above children, suggesting a possible positive link between parity and dual contraception preference.

The overall chi-square test further indicates that there is statistically significant association between parity and dual contraception preference $X^2(2, N = 174) = 13.652$, $p = 0.001$ and that the observed differences in preference proportions are not due to chance. Women who have more children are therefore more likely to prefer using dual contraception than their counterparts of low parity, possibly because they have attained their desired family sizes.

Further interrogation of the subjects in focus group discussions revealed that parity has a link with dual contraception preference. Majority of the women held the view similar to majority of their husbands that women with few or no children may not prefer using dual contraception, possibly because they need more children as opposed to women with high parity who are concerned with spacing their children or altogether avoiding conception to minimize their chances of bearing HIV infected children. They noted that child gender also influenced dual contraception preference with women having children of one particular gender less likely to prefer dual contraception as opposed to those reporting different gender.

This is possibly a reflection of cultural influence on dual contraception use. Emphasizing these views, two women participants asserted:

"I was recently married and still don't have any child. I don't use dual contraception because I need to conceive. I only use condoms rarely. I think women who have more children may apply dual contraception more than those with few or non like me." ***(FGD-Seropositive woman, Nyatike sub-County).***

"You may have seven daughters and no son. This means culturally you have no heir. You have to strive to get a son…some women also strive to get daughters if they are not yet blessed with one." ***(FGD-Seropositive woman, Nyatike sub-County).***

On the other hand, whereas the minority of women respondents argued that younger women who have no children tend to use dual contraception to delay child bearing because they focus on achieving their career goals, minority of the husbands saw no relationship between parity and preference for dual contraception claiming that women of different parity continue to want children. This perhaps hints to the fact that most men are ignorant about their partner's preference for dual contraception and their ultimate covert use. In this regard, two participants, one woman and another male explained:

"I have only one child and need more of them but have decided to space them up to give me time to concentrate on my studies and career goals." ***(FGD-Seropositive woman, Nyatike sub-County).***

"No, it depends on the couple; A woman will do what she feels is right for her. My wife has five children with the last born being three years old. We still need more children so she doesn't use dual contraception." ***(IDI-Seronegative man, Nyatike sub-County).***

Even the responses from in-depth interviews with healthcare providers greatly supported survey results. The healthcare providers unanimously agreed that seropositive women with fewer or no children tended not to prefer using dual contraception given their need for more children. They were however divided regarding the preference for dual contraception among those with more children. Majority argued that women who had more children appreciated the high cost of living and therefore sought to avoid increasing this number further by applying dual contraception. In support of this view, one of the healthcare providers asserted:

"Those with many children may prefer dual contraception because they have the number of children they desire … and they also feel the burden of large families." ***(KI-Healthcare provider, Nyatike sub-County).***

On the other hand, the minority healthcare providers held a contrary view that being a community where children are considered a blessing from God and potential heirs (especially sons), women with more children were not left behind in the race to have more children. One healthcare provider interviewee explained:

"The women compete to have more children and especially sons who hopefully will inherit their huge tracks of land. Culture dictates that ancestral land should be inherited and so

women with fewer sons especially in polygamous settings will not prefer to use dual contraception as they seek to have more children. Children are also considered a blessing (culturally) and so the more one has them, the more blessed they are." ***(KI-Healthcare provider, Nyatike sub-County).***

Similar to FGD discussants, healthcare providers pointed that preference for dual contraception was not only affected by the total number of living children one had but their balance in terms of gender. In this regard, those women who had several sons or daughters and no daughter or son respectively, for example, would naturally avoid dual contraception so as to have more children in the hope of getting a child with the desired gender. They further stated that seropositive women with high parity prefer longer term contraceptives such as implants as opposed to shorter term contraceptives such as pills and three-month injections preferred by women with low parity.

Many studies on dual contraception have focused on its use among adults (Lewani *et al*., 2014) and HIV positive women (Tsuyuki *et al*., 2003; Moroni *et al*., 2007; Lewani *et al*., 2014; Antelman *et al*., 2015). The few studies that have correlated parity and dual contraception use have presented contradicting results. Whereas a study in Ethiopia found that low parity increases odds of dual contraception use (Gebrehiwot *et al.,* 2017), another in Kenya noted that low parity decreases odds of dual contraception use and found a significant positive statistical correlation between the two variables (Antelman *et al*., 2015). This was attributed to personal and partner desire for biological child. Contrary to previous studies, this

study correlated parity and dual contraception preference among seropositive women in discordant marital relationships, where it has established a significant positive statistical association between the two variables. However, similar to reasons cited in other studies (Antelman *et al*., 2015; Mulongo *et al.,* 2017), the strong personal and partner desire for a child and the need to stop giving birth having attained desired family size were noted to lessen dual contraception preference among women with none or one child and increase dual contraception preference among women having more than two children respectively.

4.7 Bivariate Analysis of Socio-Economic Factors affecting Dual Contraception Preference

To determine socio-economic factors affecting dual contraception preference, respondents' level of education and level of monthly income were used for analysis. Bivariate analysis involving cross tabulation of predictor and outcome variables to indicate proportion of preferences for each category and chi-square tests to show statistical significance of association was performed. Information from FGDs and In-depth interviews were used to corroborate survey results.

4.7.1 Level of Education and Dual Contraception Preference

To establish the link between level of education and dual contraception preference, the two variables were cross tabulated and chi-square analysis performed. Information from FGDs and In-depth interviews were used to corroborate survey results.

An evaluation of the cross tabulated results of level of education versus dual contraception preference revealed that the proportion of seropositive women who preferred to use dual contraception generally increased with increase in level of education. Those who had none, primary, secondary and tertiary education and preferred dual contraception were 4 (28.6%), 68 (60.2%), 25 (78.1%) and 13 (86.7%) respectively as shown in Table 4.7.

Table 4.7: Cross-Tabulation of Level of Education and Dual Contraception Preference

Level of Education	**Dual Contraception Preference**			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
None	4	28.60	10	71.40
Primary School	68	60.20	45	39.80
Secondary School	25	78.10	7	21.90
Tertiary	13	86.70	2	13.30
Total	**110**	**63.20**	**64**	**36.80**

0 cells (0.0%) have expected count less than 5. $X^2 = 14.282$; df=3; p=0.003, N=174.

No missing case. Test statistically significant at $p < 0.05$.

Source: Field Survey, 2017

Seropositive women who had no any basic education had a lower proportion of those who preferred dual contraception (28.6%) compared to majority who did not prefer (71.4 %). On the contrary, the proportion of seropositive women who preferred dual contraception was generally higher among respondents who reported having some level of education. Out of the 113 respondents who reported having primary education, 68 (60.2%) preferred dual contraception while 45 (39.8%) preferred otherwise. Similarly, 25 (78.1%) of women who reported having secondary education preferred dual contraception as opposed to only seven (21.9%) who did not prefer. Generally, the proportion of women who did not prefer dual contraception decreased up the levels of education with those having tertiary education reporting the least non-preference at 13.3%. These statistics indicate a possible positive association between levels of education and dual contraception preference.

Further analysis of the crosstab table reveals that the odds that seropositive woman with no basic education prefer using dual contraception is .4 (4/10) while the odds that seropositive woman having primary education prefer using dual contraception is 1.511 (68/45). Similarly, the odds that seropositive woman having secondary education prefer using dual contraception is 3.571 (25/7). Seropositive women having tertiary education had the highest odds of preference for dual contraception of 6.5 (13/2). This analysis indicates that low levels of education decreases the odds of preference for dual contraception while high levels of education increases the odds of preference for dual contraception, an indication of a possible positive link between the two variables as observed with the percentages.

The overall chi-square test further indicates that there is statistically significant association between level of education and dual contraception preference $X^2(3, N = 174) = 14.282$, $p = 0.003$ and that the observed differences in preference proportions are not due to chance. Women who have more education are therefore more likely to prefer using dual contraception than their counterparts who have low education.

This was clearly evident when the subjects were further probed in focus group discussion where significant proportion of participants argued that seropositive women who were less educated tended to be more resistant to the use of dual contraception compared to their more educated counterparts. They were believed to hold a myriad of misconceptions about the side effects of contraceptives which affects concurrent use of condoms and modern contraceptives. More educated women were believed to be more informed on the available contraceptive options, focused on furthering their education or achieving career goals and were less susceptible to cultural and religious influences. One woman discussant asserted:

"Most seropositive women with low levels of education hold negative effects about modern contraceptives; some, for example, believe that they cause deformities in unborn children while some associate them with little sexual satisfaction. This impedes concurrent use of condoms and modern contraceptives." ***(FGD-Seropositive woman, Nyatike sub-County).***

These results were supported by majority of the husbands to seropositive women who believed that educated women are more resistant to pressure from their husbands and tend to make independent decisions regarding contraceptive use. In this regard, one husband interviewee asserted:

"Level of education has an influence because it affects one's understanding of choices to be made and their consequences. Educated women tend to resist pressure from their husbands concerning avoidance of contraceptives than their less educated loyal counterparts." ***(IDI-Seronegative man, Nyatike sub-County).***

However, few women discussants together with minority of the husbands held a contrary opinion arguing that mass media and government campaigns had served to increase the level of awareness among women regarding contraceptive options, reproductive health and HIV and AIDS, hence level of education does not influence preference for dual contraception. Further, the minority husbands argued that what people need at the end of the day is a family regardless of their level of education, suggesting that factors external to education, such as parity and culture, possibly affected women's preference to use or not to use dual contraception. One of the women discussants asserted:

''I think even women who are not highly educated also apply dual contraception as they are aware of contraceptives and reproductive health from radio and government campaigns". ***(FGD-Seropositive woman, Nyatike sub-County).***

The survey results were further corroborated by healthcare providers who unanimously agreed that level of education had a relationship with preference for dual contraception. They noted that those women with higher levels of education tended to prefer using dual contraception compared to their counterparts with lower education backgrounds. This was attributed to greater knowledge and understanding of HIV, reproductive health and contraceptives. Because of lack of knowledge and awareness, women who had little education more likely bowed to pressures from their husbands, culture, religion, and societal beliefs with regard to contraception use. Two of the healthcare provider interviewees explained:

"I strongly believe those with high education levels prefer dual contraception more than those with low education levels. A university graduate can easily understand HIV mutation and benefits of dual contraception than a primary school dropout. .....those with low education hold the belief that ARVs reduce their viral load to the extent that they can continue having unprotected sex and extramarital affairs". ***(KI-Healthcare provider, Nyatike sub-County).***

"Those with low levels of education don't appreciate the benefits of dual contraception and family planning…even after being sensitized about the same, their ignorance persists". ***(KI-Healthcare provider, Nyatike sub-County).***

Studies in Thailand (Munsakul *et al.,* 2016), Namibia, Tanzania and Kenya (Antelman *et al*., 2015) and South Africa (Moroni *et al*., 2007) found no correlation between level of education and dual contraception use among HIV positive women. Conversely, a significant positive correlation between level of education and dual contraception use has been noted in Ethiopia (Teklu and Davey, 2008; Gebrehiwot *et al.,* 2017) and Kenya (Mulongo *et al.,* 2017) among

HIV positive women. The significant positive statistical association between education level and dual contraception preference noted in this study is however unique and differs from other studies. This is because of its focus on preference for dual contraception, an area which has not been explored by other studies. The observed significant association between education and preference for dual contraception in this study and non-correlation with use in other studies may be due to the fact that to some extent preferences do not necessarily translate into use, given numerous factors influencing use such as male partner disapproval of dual contraception (Mulongo *et al.,* 2017), negative attitude towards condoms and fear of side effects of hormonal contraceptives among some seropositive women (Chakrapani *et al.,* 2011). Low preference observed among seropositive women of low education is possibly a consequence of ignorance and strict adherence to religious and cultural norms as noted in Bungoma County in Kenya (Mulongo *et al.,* 2017).

4.7.2 Level of Monthly Income and Dual Contraception Preference

To establish the link between level of monthly income and dual contraception preference, the two variables were cross tabulated and chi-square analysis performed. Information from FGDs and In-depth interviews were used to corroborate survey results.

An evaluation of the cross tabulated results of level of Monthly income versus dual contraception preference revealed that the proportion of seropositive women who preferred to use dual contraception generally increased with increase in level of monthly income. Those who earned Ksh.0-5000, Ksh.5001-10,000 and over Ksh.10,000 and preferred dual contraception were 60 (55.6%), 32 (74.4%), and 18 (78.3%) respectively as shown in Table 4.8.

Table 4.8: Cross-Tabulation of Monthly Income and Dual Contraception Preference

Monthly Income	**Dual Contraception Preference**			
	Yes		No	
	Frequency	Percent (%)	Frequency	Percent (%)
Ksh.0 - 5,000	60	55.60	48	44.40
Ksh.5,001- 10,000	32	74.40	11	25.60
Over Ksh.10,000	18	78.30	5	21.70
Total	**110**	**63.20**	**64**	**36.80**

0 cells (0.0%) have expected count less than 5. $X^2 = 7.285$; df=2; p=0.026, N=174.

No missing case. Test statistically significant at $p < 0.05$.

Source: Field Survey, 2017

The proportion of seropositive women who preferred dual contraception was notably higher in all income groups compared to the proportion that did not prefer. Out of the 118 respondents who reported earning not more than Ksh.5000, 60 (55.6%) preferred dual contraception while 48 (44.4%) did not. Likewise, 32 (74.4%) of women who earned Ksh.5001-10,000 preferred dual contraception as opposed to only 11 (25.6%) who did not prefer. In general, the proportion of women who did not prefer dual contraception decreased

with increase in monthly incomes with those earning more than Ksh.10,000 reporting the least non-preference at 21.7%. These statistics indicate that a larger proportion of seropositive women earning higher monthly incomes prefer dual contraception compared to their counterparts who earn low monthly incomes.

Further analysis of the crosstab table reveals that the odds that seropositive woman who earn not more than Ksh.5000 prefer using dual contraception is 1.25 (60/48) while the odds that seropositive woman earning between Ksh.5001-10,000 prefer using dual contraception is 2.909 (32/11). Seropositive women earning more than Ksh.10,000 had the highest odds of preference for dual contraception of 3.6 (18/5). This analysis indicates that low monthly incomes decreases the odds of preference for dual contraception while high monthly incomes increases the odds of preference for dual contraception, an indication of a possible positive link between the two variables as observed with the percentages.

The overall chi-square test further indicates that there is statistically significant association between level of monthly income and dual contraception preference $X^2(2, N = 174) = 7.285$, $p = 0.026$ and that the observed differences in preference proportions are not due to chance. Women who earn higher monthly incomes are therefore more likely to prefer using dual contraception than their counterparts who earn low monthly incomes.

This was supported by views of the majority of survey subjects further probed in focus group discussion who held the view that women with high incomes preferred to use dual contraception compared to their counterparts who earned little income because they could easily afford the contraceptives they desired, some of which are out of reach of their counterparts who earned lower incomes. They noted that contraceptives like implants, IUDs and sterilization were charged in various health facilities with implant insertion and removal being charged at a cost of Ksh.300 and Ksh.200 respectively, a scenario that forced some women not to prefer using implants and condoms and instead opted for other low cost or free contraceptives with condoms or use condoms only to provide dual protection.

The transport cost to and from distant health facilities was also noted to be a barrier do adoption of dual contraception among low income earners, similar views held by majority of the husbands who further argued that some preferred contraceptives such as tubal ligation were not available in most of the local health facilities. In far health facilities where female sterilization and IUDs services were offered, both transport cost and service fee were beyond the reach of most women in the area. In this regard, one woman discussant asserted:

''Some contraceptives like implants and IUDs are charged in health facilities. Even though the charges are low, some of us may not afford it due to widespread poverty in the area, making it difficult to use condoms and contraceptives simultaneously.'' ***(FGD-Seropositive woman, Nyatike sub-County).***

Both the minority of the women discussants and the husbands interviewed contended that there was little or no difference with regard to dual contraception preference across women with different income levels. They argued that most types of contraceptives are offered to women free of charge in public hospitals and therefore affordable to both high and low income earners. To this extent, one woman explained:

"Today, many government hospitals offer some contraceptives like pills, condoms and injectables free of charge which means every woman regardless of their income can afford to use modern contraceptives together with condoms.'' ***(FGD-Seropositive woman, Nyatike sub-County).***

The survey results were further supported by health care providers interviewed who unanimously agreed that seropositive women who earn higher incomes tend to prefer dual contraception. They argued that given their high incomes, such women could more easily afford the kind of modern contraceptives they preferred to use with condoms and could also travel to seek family planning services in distant facilities if their desired services were not available at their local health facilities. Further, they appreciate the high cost of living and therefore applied dual contraception as a way of reducing the economic burden. However, many women with lower income levels on their part tend to believe that God is the provider and caretaker of children and that prevention of conception is sinful. They further stated that some of the seropositive women with lower income levels who could not afford their preferred contraceptives to be used with condoms (implants and IUDs) opted for condoms only or contraceptive pills and injections offered freely. It was noted that when condoms run

out in health facilities, poor seropositive women were more likely not to use condoms possibly because they lacked cash coupled with fear to purchase condoms from local shops.

Studies have shown that cost and proximity of services significantly determine contraceptive use and that many women who seek family planning are generally more likely to use low-cost services (Kayongo, 2013). Similarly seropositive women earning high income report high use of contraceptives than their counterparts earning low income (Agha, 2000; Bongomin *et al.*, 2018; Damian *et al.*, 2018). With respect to dual contraception, a study in India noted that cost of contraceptives was not a barrier to adoption of dual contraception among men and women living with HIV (Chakrapani *et al*., 2011) because contraceptives were offered free in health facilities. This was however contrary to the findings in S.E Nigeria where cost was found to reduce odds of dual contraception use among HIV positive women (Lewani *et al*., 2014).

The significant association between monthly income levels and dual contraception preference among seropositive women observed in this study differs from previous studies which only focused on cost and dual contraception use. The high odds of preference among women of high income may be due to the fact that they could easily afford the transport cost to distant facilities and the cost of specialized contraceptives such as female sterilization associated with few side effects, so as to use them concurrently with condoms as was noted in Nigeria (Lewani *et al*., 2014). The low preference observed among low income earners indicates the

need to make available and free all types of contraceptive methods in all health facilities and reduction of transport cost to distant facilities via increasing the number of health facilities.

4.8 Logistic Regression Analysis

A multivariate logistic regression analysis was performed to ascertain the effects of age, parity (total number of living children), level of education and level of monthly income on the likelihood that seropositive women in discordant marital relationships prefer dual contraception. Table 4.9 shows the final model with all the predictor variables included.

Table 4.9: Results of Multivariate Logistic Regression Analysis on Factors affecting Dual Contraception Preference

Variables	Dual Contraception Preference							
	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Age (40-49) *Rc*			11.752	2	**			
18-29	1.976	.629	9.855	1	**	7.214	2.101	24.774
30-39	.666	.550	1.469	1	.226	1.947	.663	5.720
Total Children (≥4) *Rc*			16.724	2	***			
0-1	-2.339	.602	15.100	1	***	.096	.030	.314
2-3	-.692	.478	2.095	1	.148	.501	.196	1.278
Education Level (Tertiary) *Rc*			9.040	3	*			
None	-3.017	1.098	7.549	1	**	.049	.006	.421
Primary	-2.270	.901	6.344	1	*	.103	.018	.604
Secondary	-1.568	.973	2.598	1	.107	.208	.031	1.403
Monthly Income (Over Ksh.10000) *Rc*			3.008	2	.222			
Ksh.0-5000	-.214	.635	.113	1	.737	.808	.232	2.806
Ksh,5001-10,000	.569	.718	.629	1	.428	1.767	.433	7.211
Constant	2.345	.986	5.655	1	*	10.434		

***p<.001; **p<.01; *p<.05; Overall model chi-square (9, N = 174) = 43.382, p<.001. Nagelkerke R^2 = 30.2%; N = 174; Goodness of model fit, p = .794. Test significant at $p \leq 0.05$. *Rc*-Reference category.

Source: Field Survey, 2017

The logistic model was statistically significant, $X^2(9, N=174) = 43.382$, $p < 0.05$. The model explained 30.2% of the variance in the outcome variable and correctly classified 74.7% of cases to prefer dual contraception. The percentage of cases that were correctly predicted as preferring dual contraception (true positives) were 83.6% while the percentage of cases that were correctly predicted as not preferring dual contraception (true negatives) were 59.4%. Further, the Hosmer and Lemeshow test for model goodness-of-fit showed that the model adequately fits the data, $X^2(8) = 4.649$; $p=.794$.

In the final model, the predictor variables that significantly contributed to predicting dual contraception preference were age, Wald (2, N=174) = 11.752, $p=.003$; parity, Wald (2, N=174) = 16.724, $p < 0.05$ and level of education, Wald (3, N=174) = 9.040, $p=.029$. However, monthly income did not contribute significantly to predicting dual contraception, Wald (2, N=174) = 3.008, $p=.222$.

Age registered a mixed result where some categories were significant and others insignificant. Seropositive women in the age group 18-29 years had a significant effect on dual contraception preference. They were more than seven times greater (df=1, OR 7.214, 95% CI 2.101-24.774; $p=.002$) to prefer dual contraception than their counterparts aged 40-49 years (reference category). However seropositive women in the age group 30-39 years had insignificant effect on dual contraception preference. Their odds of preference for dual contraception did not differ significantly with the reference category (df=1, OR 1.947, 95% CI 0.663-5.720; $p=.226$).

Seropositive women who had none or one child (df=1, OR .096, 95% CI 0.030-341; $p < 0.05$) had a significant effect on dual contraception preference and were less likely to prefer dual contraception compared to their counterparts who had four and above children (reference category). On the other hand, the odds that seropositive women who had two or three children prefer dual contraception did not differ significantly with the reference category (df=1, OR .501, 95% CI 0.196-1.278; p=.148).

With regard to socio-economic variables, seropositive women who had no any basic education (df=1, OR .049, 95% CI 0.006-0.421; P=.006), and those who had primary education (df=1, OR .103, 95% CI 0.018-0.604; P=.012) had a significant effect on dual contraception preference and were both less likely to prefer dual contraception compared to their counterparts who had tertiary education (reference category). Conversely those having secondary education (df=1, OR .208, 95% CI 0.031-1.403; p=.107) had insignificant difference in terms of odds of preference for dual contraception compared to the reference category and as a result insignificantly affected dual contraception preference.

Generally the model revealed that factors associated with increased odds of dual contraception preference among seropositive women were younger age, high parity and high levels of education. However, older age, low parity (few number of children) and low levels of education decreased the odds of dual contraception preference. Contrary to other research findings where low income level (Higgins, 2012) and cost of contraceptives (Lewani *et al*.,

2014) have been noted to reduce odds of dual contraception use, this study has noted that monthly income has no significant effect on dual contraception preference.

Comparable to study findings, though with regard to dual contraception use, other studies have noted that younger age increases the odds of dual contraception use while older age decreases odds of dual contraception use (Eisenberg, 2012; Higgins and Cooper, 2012; Moroni *et al*., 2007; Antelman *et al*., 2015). Having fewer living children has also been noted to decrease odds of dual contraception use (Antelman *et al*., 2015). In addition, higher education has been noted to increase odds of dual protection involving concurrent use of condoms plus modern contraceptives (Teklu and Davey, 2008). Because these earlier studies found that age, parity and level of education significantly predicts dual contraception use, the current study presents a different finding revealing their significant prediction for dual contraception preference.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives summary and conclusions with regards to study findings. In addition, the chapter provides recommendations for policy formulations and further research.

5.2 Summary

This study mainly focused on the association between demographic and socio-economic factors and dual contraception preference. The data was collected in fourteen health facilities purposively selected within Nyatike Sub-county. A total of 174 seropositive women aged between 18-49 years in HIV discordant marital relationships participated in the study survey and were subjected to interviewer administered questionnaire. The study also involved four FGDs with seropositive women in discordant marital relationships and 28 in-depth interviews (with 14 healthcare providers as key informants and 14 seronegative men in discordant marital relationships).

This study revealed that there was low dual contraception prevalence (29.3%) among the study participants despite high level of dual contraception preference (63.2%). The main reasons cited by respondents for this low prevalence included fear of side effects, partner's refusal, need for more children, cultural and religious beliefs and ignorance.

Condom plus injection was the most commonly used form of dual contraception among respondents (24.1%) followed by condoms plus implants at 19.1%. Injection was most favored because of its ease of secret use while implants offered long term solution to preventing pregnancy. Contraceptive pills plus condoms was the least used form of dual contraception (1.7%) because oral pills created pill burden and offered no privacy.

Predictor variables that were significantly associated with dual contraception preference were Parity, $X^2(2, N=174) = 13.562$, $p=.001$; level of education $X^2(3, N=174) = 14.282$, $p=.003$ and monthly income, $X^2(2, N=174) = 7.285$, $p=.026$. However age did not have statistically significant association with dual contraception preference, $X^2(2, N=174) = 5.964$, $p=.051$.

In the final model, the predictor variables that significantly contributed to predicting dual contraception preference were age, Wald (2, N=174) = 11.752, $p=.003$; parity, Wald (2, N=174) = 16.724, $p < 0.05$ and level of education, Wald (3, N=174) = 9.040, $p=.029$. However, monthly income did not contribute significantly to predicting dual contraception, Wald (2, N=174) = 3.008, $p=.222$.

5.3 Conclusions

Objective One: To find out dual contraception prevalence among seropositive women in discordant relationships, the study concluded that there is low dual contraception prevalence among the study participants.

Objective Two: To determine the most common form of dual contraception used among seropositive women to offer dual protection, the study concluded that male condoms plus injectables was the most common form of dual contraception used. However the use of male condoms jointly with implants was significantly higher.

Objective Three: To establish the association between demographic factors and dual contraception preference, the study concluded that there is no significant statistical association between age and dual contraception preference. However parity had a significant positive statistical association with dual contraception preference.

Objective Four: To establish the association between socio-economic factors and dual contraception preference, the study concluded that both level of education and monthly income levels had a significant positive association with dual contraception preference.

5.4 Recommendations

5.4.1 Recommendations for Policy Formulation

1. To find out dual contraception prevalence among seropositive women in discordant marital relationships, the study found low dual contraception prevalence and recommends that both the National and County governments through the Ministry of Health to develop reproductive health programs that intensify efforts in improving knowledge of dual contraception and its critical health benefits among seropositive women to scale-up its use. Such health talks should encourage constructive partner communication and

engagement in FP, dispel off misconceptions about modern contraceptives and thoroughly sensitize male partners of seropositive women on the importance of consistent use of condoms in safeguarding their health.

2. To determine the most common form of dual contraception used among seropositive women to offer dual protection, the study found that condoms plus injectables was the most common form of dual contraception used and recommends that the Ministry of Health at the national level in collaboration with Ministry of Health, Migori County to provide a wide range of modern contraceptives in all health facilities particularly female sterilization, vasectomy and IUDs whose supply were noted to be limited in some health facilities. This is to encompass different preferences for modern contraceptive methods to be used together with condoms to offer dual protection. Secondly, it will facilitate the use of long-acting contraceptives for pregnancy prevention together with condoms.

3. To establish the association between demographic factors and dual contraception preference, the study found that parity had a significant positive association with dual contraception preference and recommends that health care providers in Nyatike Sub-county health institutions should educate seropositive women of low parity who desire to have more children on safe conception measures to minimize HIV transmission to uninfected male partners. Such counseling should focus on home manual insemination or timed unprotected sex during woman's peak fertility period coupled with administration of PrEP to uninfected male partner to limit chances of HIV infection.

4. To establish the association between socio-economic factors and dual contraception preference, the study found that both level of education and level of monthly income had significant positive association with dual contraception and recommends that health care providers in all health facilities in Nyatike Sub-county to sensitize women of low education on the benefits of dual contraception to increase dual contraception preference among them. The study also recommends to Ministry of Health at National Government in collaboration with Migori County Ministry of Health to supervise and ensure that the provision of all contraceptives in all public health facilities is done at no cost, offer subsidy to private health facilities to reduce contraceptive costs and establish more health facilities to reduce transport cost to distant facilities. These are meant to scale-up dual contraception use among seropositive women of low income group.

5.4.2 Recommendations for Further Research

Further research into the effect of child gender on consistent use of dual contraception among discordant couples is proposed. This is to help understand how the two variables correlate and to assess whether child gender is statistically significant in predicting dual contraception among discordant couples in order to better inform HIV-integrated family planning policies.

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APPENDICES

APPENDIX I: LETTER OF INTENT

MoH Nyatike Sub-county,

P.O.Box 99,

Macalder.

Re: Request to carry out research in Health Facilities in Nyatike Sub-County.

I am a post-graduate student at Rongo University pursuing Masters of Arts in geography. I would like to bring to your attention of my desire to conduct a study in fourteen Health Facilities in Nyatike Sub-County. The study is titled **"Factors affecting dual contraception preference among seropositive women in discordant relationships in Nyatike sub-County, Kenya.''**

The study will be based in fourteen health facilities. It will involve seropositive women in discordant marital relationships, aged between 18-49 years (182 survey respondents and 28 for FGDs participants). It will also involve fourteen seronegative men in discordant marital relationships (aged between 18-59 years) and fourteen health providers for in-depth interviews. All interviews and FGDs shall strictly adhere to ethical guidelines.

Thanks in advance.

Yours sincerely

OUMA MARK OKUNGU KADENYO.

APPENDIX II: QUESTIONNAIRE INTERVIEW RESPONDENT CONSENT FORM

I am OUMA MARK OKUNGU KADENYO, a post-graduate student at Rongo University undertaking Master of Arts in geography. You are being asked to take part as an interviewee in this study to provide some information on how your demographic and socio-economic characteristics influence your preference for dual contraception. No information regarding your identity shall be obtained or disclosed in reports, publications, or presentations.

Your participation is voluntary, and you are not obliged to answer any questions you do not want to answer. You have the right to withdraw from the study at any time without any penalty.

RESPONDENT AGREEMENT

This questionnaire interview respondent consent form for the study titled 'Factors affecting dual contraception preference among seropositive women in discordant relationships' has been read and explained to me. I agree to participate as a respondent.

Signature……..Date…….

Random number of the respondent……..

APPENDIX III: QUESTIONNAIRE INTERVIEW SCHEDULE

I am OUMA MARK OKUNGU KADENYO, a post-graduate student at Rongo University pursuing Masters of Arts in geography. I'm interested in learning about how your demographic and socio-economic factors influence your preference for dual contraception. I will ask you several questions pertaining this and I am requesting you to answer them to the best of your ability and honestly as possible. Whatever information you provide will be kept strictly confidential.

PATR I: Preliminary Information

Random No……..Date of Interview……..

1. Sub-county…….....
2. Health Facility Name…….

3. Level of health facility where interview took place.

***(Tick the right answer*)**

a. Hospital ☐

b. Health Centre ☐

c. Dispensary ☐

d. Others……

4. Type of health facility where interview took place:

***(Tick the right answer*)**

a. Government ☐

b. Family Planning Association Clinics ☐

c. Private ☐

PART II: Background Characteristics of Respondents

1. What is your age? ……..

2. How many children do you have? ……

3. What is your level of education?

(Tick the right answer)

i) None ☐

ii) Primary school ☐

iii) Secondary school ☐

iv) Tertiary ☐

4. What is your level of monthly income in the following categories?

a) Salary: …….....**.....**

b) Income from business: ……. Specify type of business: ……...

c) Sales from farm products: …… Specify type of product: …….

5. Give the total monthly income from the above stated categories: ….……

PART III: Dual Contraception Prevalence and Preference.

A. Dual Contraception Prevalence.

1. Have you and your partner ever used dual contraception within the last 6 months to offer dual protection against unwanted pregnancy and HIV/AIDS? ***(Tick the right answer as given by the respondent)***

i) Yes ☐ ii) No ☐

2. If yes;

a) How often did you and your partner use dual contraception in the last 6 months?

i) Every time of sexual intercourse (consistently) ☐ ii) Non-consistently/Rarely ☐

Reason……

……

……

b) (i) Which modern contraceptive method did you and your partner used together with condoms to offer dual protection? ***(Probe for the following methods and tick the right answer as given by respondent)***

i) Contraceptive pills ☐

ii) Injectables ☐

iii) Implants ☐

iv) Intrauterine devices (IUDs) ☐

v) Sterilization ☐

vi) Vasectomy ☐

(ii) Why did you use this type of contraceptive method together with condoms?

……..…

..……..……..

.....

3. If No, which contraceptive do you use?

Categories for non-dual users	**Tick Appropriately**	**Specify the type of Contraceptive & Traditional method**
Condoms only		
Contraceptive minus condoms		
Traditional methods		

Reason……..

…..……

B) Dual Contraception Preference

1. Do you prefer using dual contraception to offer dual protection?

(Tick appropriately)

Yes ☐

No ☐

THANK YOU VERY MUCH

APPENDIX IV: FOCUS GROUP DISCUSSION PARTICIPANT CONSENT FORM

I am OUMA MARK OKUNGU KADENYO, a post-graduate student at Rongo University undertaking Master of Arts in geography. You are being asked to take part in a Focused Group Discussion in this study to provide some information on how your demographic and socio-economic characteristics influence your preference for dual contraception. This will involve talking openly for about 60 minutes in a group of six other respondents who have also decided to participate in the study. Notes will be taken so we can remember what was said, but your name and other identifying information will not be recorded. Your participation will be completely voluntary, and you are not obliged to answer any questions you do not want to answer. You have the right to withdraw from the study at any time without any penalty.

PARTICIPANT AGREEMENT FOR FOCUS GROUP DISCUSSION

This Focus Group Discussion participant consent form for the study titled factors affecting dual contraception preference among seropositive women in discordant relationships has been read and explained to me. I agree to participate as a respondent.

Signature……..... Date……

Random number for participant……..

Health facility name……

APPENDIX V: FOCUS GROUP DISCUSSION GUIDE

(With appropriate adaptation by FGD leader for use with groups of seropositive women in discordant marital relationships).

A. Dual Contraception Prevalence.

1. Have you and partner ever used dual contraception within the last six months to offer dual protection against unwanted pregnancy and HIV/AIDs? ***(FGD leader to define for participants the meaning of dual contraception as: Consistent condom use to prevent HIV/STIs infection together with a more effective modern contraceptive method - hormonal, intrauterine devices or permanent for pregnancy prevention).***

2. Which modern contraceptive method for pregnancy prevention is mostly used together with condoms to offer dual protection?

B. Dual Contraception Preference.

(Probe the questions focusing only on seropositive women in discordant marital relationships)

i. Do you prefer using dual contraception?

ii. Do you think age affects preferences for dual contraception use?

iii. Do you think level of education affects preference for dual contraception?

iv. Does parity influence preference for dual contraception?

v. Do you think monthly income levels influences preference for dual contraception?

Thank you for participating in this FGD.

APPENDIX VI: MODERATOR DECLARATION FOR FOCUS GROUP DISCUSSION

I have reviewed the consent form with this study participant, and has fully agreed to be in this focus group. I further agree to keep confidential anything that is said in the discussion group.

Moderator' name…….

Signature of moderator……

Date…….

Thank you.

APPENDIX VII: IN-DEPTH INTERVIEW CONSENT FORM FOR HEALTH PROVIDERS

I am OUMA MARK OKUNGU KADENYO, a post-graduate student at Rongo University undertaking Master of Arts in geography. You are being asked to participate in an in-depth interview as a key informant in this study to provide expertise information on how the demographic and socio-economic backgrounds influence your clients' preference for dual contraception. This will involve talking openly for about 60 minutes where you shall be asked questions by the researcher on the said topic. Notes will be taken so we can remember what was said, but your name and other identifying information will not be recorded. Your participation will be completely voluntary, and you are not obliged to answer any questions you do not want to answer. You have the right to withdraw from the study at any time without any penalty.

HEALTH CARE PROVIDER AGREEMENT FOR IN-DEPTH INTERVIEW

This in-depth interview participant consent form for the study titled factors affecting dual contraception preference among seropositive women in discordant relationships has been read and explained to me. I agree to participate as a respondent.

Signature……...Date…….

Health facility name……..

APPENDIX VIII: IN-DEPTH INTERVIEW GUIDE FOR HEALTH CARE PROVIDERS

PART I: HEALTH PROVIDER DETAILS

1. Name of health facility: …….
2. Age: …… Sex: Male ☐ Female ☐
3. How long have you worked as a health care provider? ☐ Years

PART II: FACTORS INFLUENCING DUAL CONTRACEPTION PREFERENCE.

1. Do seropositive women in discordant marital relationships who receive their HIV/ FP services in this health facility use dual contraception?
2. Which modern contraceptive for pregnancy prevention do they use most with condoms to offer dual protection?
3. Do you think seropositive women in discordant marital relationships prefer using dual contraception to offer dual protection?
4. Do the following demographic backgrounds of seropositive women in discordant marital relationships influence their preference for dual contraception?
   a) Age **(b)** Parity
5. Do the following socio-economic backgrounds of seropositive women in discordant marital relationships influence their preference for dual contraception?
   a) Level of education **(b)** Monthly Income levels

Thank you for participating in this interview.

APPENDIX IX: IN-DEPTH INTERVIEW CONSENT FORM FOR MEN

I am OUMA MARK OKUNGU KADENYO, a post-graduate student at Rongo University undertaking Master of Arts in geography. You are being asked to participate in an in-depth interview in this study titled 'Factors affecting dual contraception preference among seropositive women in discordant relationships in Nyatike Sub-county, Kenya'. You shall be asked, in the language you feel most comfortable speaking, to provide information on how the demographic and socio-economic backgrounds influence preference for dual contraception among seropositive women in discordant relationships. Your name and other identifying information will not be recorded. Your participation will be completely voluntary, and you are not obliged to answer any questions you do not want to answer. You have the right to withdraw from the study at any time without any penalty.

PARTICIPANT AGREEMENT FOR IN-DEPTH INTERVIEW

This participant in-depth interview consent form for the study titled 'Factors affecting dual contraception preference among seropositive women in discordant relationships has been read and explained to me. I agree to participate as a respondent.

Signature……...Date……

Health facility name……**....**

Random number of the participant: …….

APPENDIX X: IN-DEPTH INTERVIEW GUIDE FOR MEN

PART I: PARTICIPANT DETAILS

a) Random number: ……..

b) Health facility name: ……

c) Age: ☐ Years

PART II: DUAL CONTRACEPTION PREFERENCE.

1. Does your partner use dual contraception? ***(Interviewer to define for participants the meaning of dual contraception as: Consistent condom use to prevent HIV/STIs infection together with a more effective modern contraceptive method (hormonal, intrauterine devices, permanent) for pregnancy prevention).***
2. Which modern contraceptive for pregnancy prevention do you think they use most with condoms to offer dual protection?
3. Does the age of seropositive women in discordant marital relationships influence their preferences to use or not to use dual contraception?
4. Does parity of seropositive women in discordant marital relationships influence their preferences to use or not to use dual contraception?
5. Do you think the level of education of seropositive women in discordant marital relationships influence their preferences to use or not to use dual contraception?
6. Do you think the monthly income levels of seropositive women in discordant marital relationships influence their preferences to use or not to use dual contraception?

Thank you for taking part in this in-depth interview.

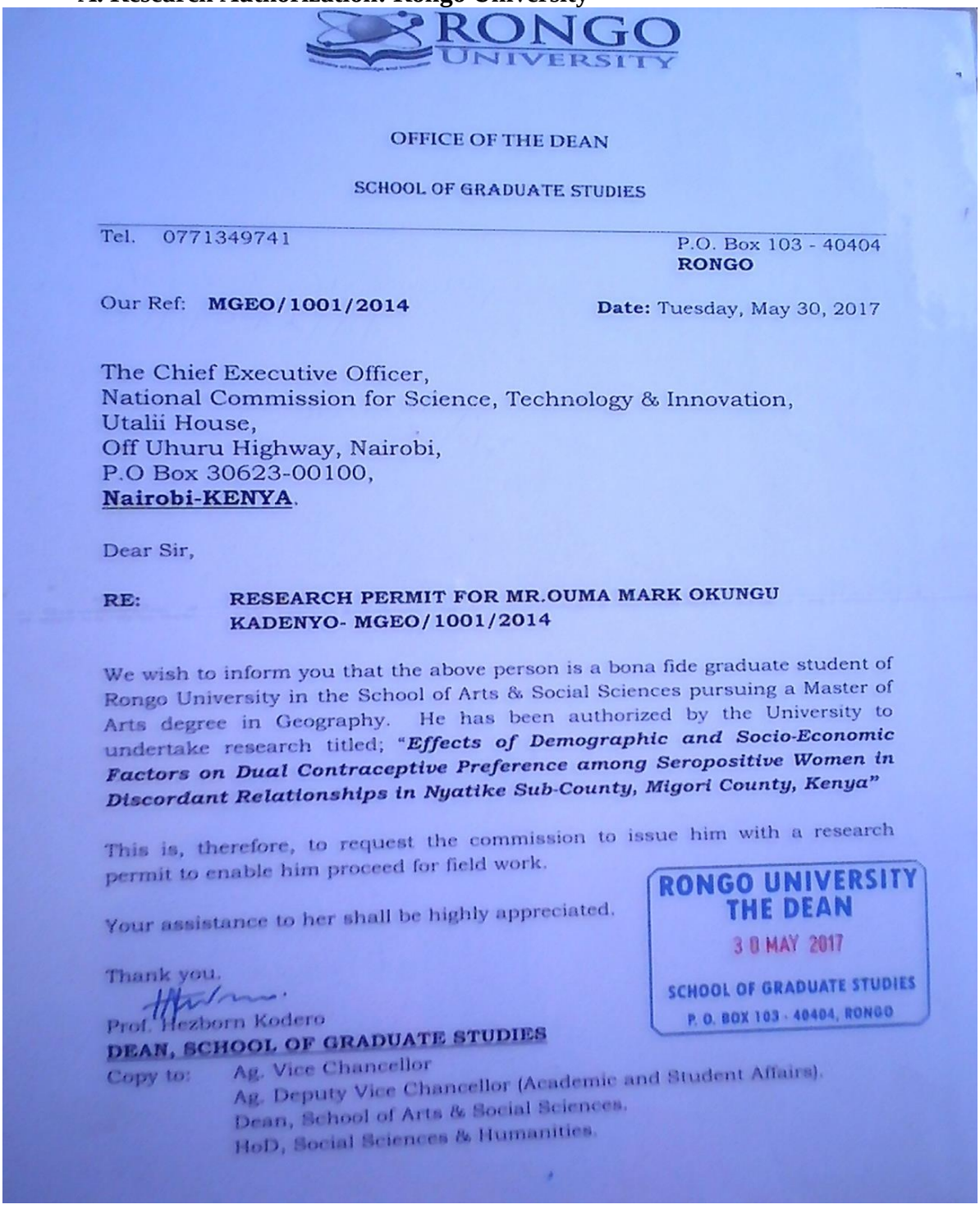
APPENDIX XI: CATEGORICAL VARIABLE CODING FOR REGRESSION ANALYSIS

Variables		Frequency	Parameter coding		
			(1)	(2)	(3)
Level of education	None	14	1.000	.000	.000
	Primary School	113	.000	1.000	.000
	Secondary School	32	.000	.000	1.000
	Tertiary	15	.000	.000	.000
Monthly income	Ksh.0 - 5,000	108	1.000	.000	
	Ksh.5,001- 10,000	43	.000	1.000	
	Over Ksh.10,000	23	.000	.000	
Total children	0-1	41	1.000	.000	
	2-3	82	.000	1.000	
	4 and Above	51	.000	.000	
Age	18-29	85	1.000	.000	
	30-39	64	.000	1.000	
	40-49	25	.000	.000	

Source: Field Survey, 2017

APPENDIX XII: APPROVAL LETTERS

A. Research Authorization: Rongo University



RONGO UNIVERSITY

OFFICE OF THE DEAN

SCHOOL OF GRADUATE STUDIES

Tel. 0771349741

P.O. Box 103 - 40404
RONGO

Our Ref: **MGEO/1001/2014**

Date: Tuesday, May 30, 2017

The Chief Executive Officer,
National Commission for Science, Technology & Innovation,
Utalii House,
Off Uhuru Highway, Nairobi,
P.O Box 30623-00100,
Nairobi-KENYA.

Dear Sir,

RE: RESEARCH PERMIT FOR MR.OUMA MARK OKUNGU KADENYO- MGEO/1001/2014

We wish to inform you that the above person is a bona fide graduate student of Rongo University in the School of Arts & Social Sciences pursuing a Master of Arts degree in Geography. He has been authorized by the University to undertake research titled; ***"Effects of Demographic and Socio-Economic Factors on Dual Contraceptive Preference among Seropositive Women in Discordant Relationships in Nyatike Sub-County, Migori County, Kenya"***

This is, therefore, to request the commission to issue him with a research permit to enable him proceed for field work.

Your assistance to her shall be highly appreciated.

Thank you.

RONGO UNIVERSITY
THE DEAN
30 MAY 2017
SCHOOL OF GRADUATE STUDIES
P. O. BOX 103 - 40404, RONGO

Prof. Hezborn Kodero
DEAN, SCHOOL OF GRADUATE STUDIES

Copy to: Ag. Vice Chancellor
Ag. Deputy Vice Chancellor (Academic and Student Affairs).
Dean, School of Arts & Social Sciences.
HoD, Social Sciences & Humanities.

B. Research Permit: NACOSTI

NATIONAL COMMISSION FORSCIENCE,
TECHNOLOGY ANDINNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O Box 30623-00100
NAIROBI-KENYA

Ref No. **NACOSTI/P/17/11884/17790**

Date: **4th July, 2017**

Mark Ouma Kadenyo
Rongo University College
P.O. Box 103-40404
RONGO.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Effects of demographic and socio-economic factors on dual contraceptive preference among seropositive women in discordant relationships in Nyatike Sub-County ,Migori County, Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Migori County** for the period ending **3rd July, 2018.**

You are advised to report to **the County Commissioner and the County Director of Education, Migori County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Migori County.

The County Director of Education
Migori County.

C. Research Approval: Ministry of Health Nyatike sub-County

MIGORI COUNTY

DEPARTMENT OF HEALTH

Telegrams: "MOH," Migori.
Telephone: Suna (059) 20058
Email No. nyatike dmoh@gmail.com
When replying please quote

MEDICAL OFFICER OF HEALTH,
NYATIKE SUBCOUNTY
P.O. BOX 99.
MACALDER

MIG/NYT/ADM./5/VOL.I/ 18/07 /2017 .

Mr Mark Ouma Kadenyo,
Rongo University College,
P. O. Box 103 – 40404.
RONGO.

RESEARCH AUTHORIZATION.

I am in receipt of the documentation you presented to my office regarding your research on ***"Effects of demographic and socio-economic factors on dual contraceptive preference among seropositive women in discordant relationships in Nyatike Sub-County,Migori County kenya"*** . I note that you have followed due diligence regarding the conduct of your research and informed the relevant authorities here in Migori County. You are hereby authorized to commence data collection as stipulated in your research protocol. Kindly note that you are required to adhere to hospital policies and regulations as you conduct the data collection. Also note that you are required to update the Sub county administration on your progress from time to time and to adhere to the timelines as stipulated by the research permit. Upon completion of your study, you will be required to share the findings through an appropriate dissemination forum within the Sub County. We wish you well as you commence your study.

for Semondi

MEDICAL SUPERINTENDENT
MACALDER DISTRICT HOSPITAL
P.O. BOX 99
NYATIKE

Dr. Erick Omondi,
Medical Officer of Health
Nyatike Sub County.

Cc
County Commissioner Migori County

County Director of Health

County Director of Education

D. Research Approval: Sub-County Commissioner

THE PRESIDENCY

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telephone:
Fax No.
Email:dcnyatike@yahoo.com
When replying please quote

DEPUTY COUNTY COMMISSIONER'S OFFICE,
NYATIKE SUB COUNTY,
P.O. BOX 1- 40402,
MACALDER.

REF: ED.12/15/ VOL.1/ (001)

DATE: 12th July, 2017

To All
Assistant County Commissioners
NYATIKE SUB-COUNTY

RE: RESEARCH AUTHORIZATION

The above matter refers

Mark Ouma Kadenyo NACOSTI/P/17/11884/17790 a student at Rongo University has been authorized to carry out research on "Effects of demographic and socio-economic factors on dual contraceptive preference among seropositive women in discordant relationships in Nyatike Sub-County, Migori County for the period ending 3rd July, 2018.

Accord him the necessary assistance.

DEPUTY COUNTY COMMISSIONER
NYATIKE SUB-COUNTY

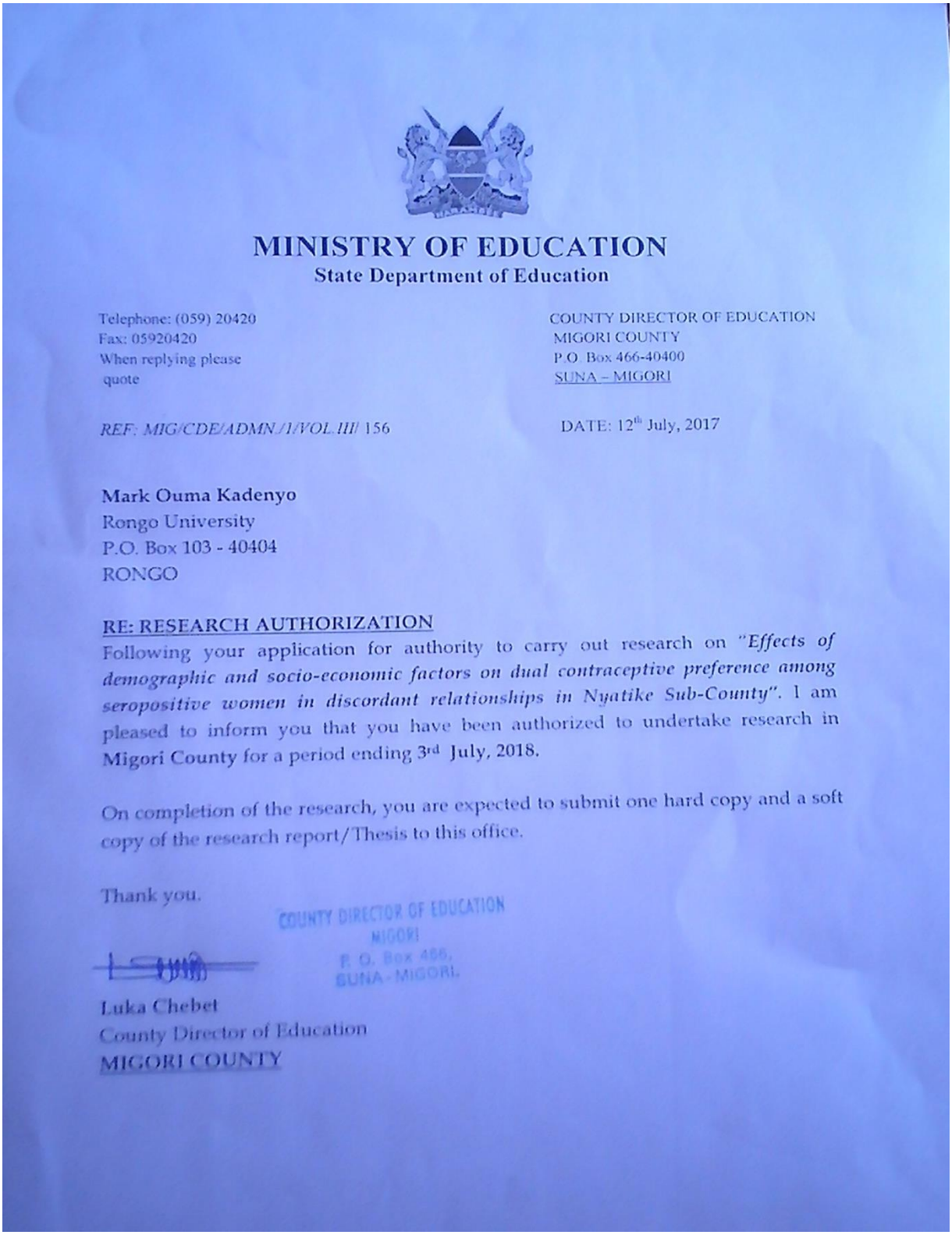
JAMES .M. MABEYA
FOR: DEPUTY COUNTY COMMISSIONER
NYATIKE SUB-COUNTY

CC: County Commissioner
MIGORI COUNTY

County Director of Education
MIGORI COUNTY

County Director of Education
NYATIKE SUB-COUNTY

E. Research Approval: County Director of Education



MINISTRY OF EDUCATION
State Department of Education

Telephone: (059) 20420
Fax: 05920420
When replying please quote

COUNTY DIRECTOR OF EDUCATION
MIGORI COUNTY
P.O. Box 466-40400
SUNA – MIGORI

REF: MIG/CDE/ADMN./1/VOL.III/ 156

DATE: 12th July, 2017

Mark Ouma Kadenyo
Rongo University
P.O. Box 103 - 40404
RONGO

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *"Effects of demographic and socio-economic factors on dual contraceptive preference among seropositive women in discordant relationships in Nyatike Sub-County"*. I am pleased to inform you that you have been authorized to undertake research in **Migori County** for a period ending 3rd **July, 2018.**

On completion of the research, you are expected to submit one hard copy and a soft copy of the research report/Thesis to this office.

Thank you.

COUNTY DIRECTOR OF EDUCATION
MIGORI
P. O. Box 466,
SUNA - MIGORI.

Luka Chebet
County Director of Education
MIGORI COUNTY

F. Research Approval: County Commissioner

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND CO ORDINATION OF NATIONAL GOVERNMENT

Telephone: (059) 20511
FAX (059)20361
Email:
countycommissionermigori@yahoo.com

OFFICE OF THE COUNTY COMMISSIONER
MIGORI COUNTY
P.O. BOX 2 - 40400
SUNA- MIGORI.

When replying please quote

Ref No: ED.12/19 VOL. I/(288)

Date: 12th July, 2017

TO WHOM IT MAY CONCERN

RE: RESEACH AUTHORISATION

Mark Ouma Kadenyo NACOSTI/P/17/11884/17790 a student at Rongo University has been authorized to carry out research on "***Effects of demographic and socio-economic factors on dual contraceptive preference among seropositive women in discordant relationships in Nyatike Sub-county,Migori County, Kenya"*** *for* the period ending 3rd July, 2018.

Accord him the necessary assistance.

COUNTY COMMISSIONER
P.O BOX 2 – 40400
SUNA – MIGORI
MIGORI COUNTY

PETER G. MUTU
FOR: COUNTY COMMISSIONER
MIGORI COUNTY

CC
The County Director of Education
MIGORI.